

Inside: Your 1983 Reader's Choice Ballot

80 micro

A WAYNE GREEN PUBLICATION

September 1983 USA \$4.00

the magazine for TRS-80® users

®

Confused?

How to Become A Better Planner

Plus

- Our Businessman's Bazaar
- Your Micro Goes Terminal
- More on the Model 100
- Taking the Gran Tour
- The Satellite CoCo



74470 65947

*TRS-80 IS A TRADEMARK OF RADIO SHACK, A DIVISION OF TANDY CORP.

Introducing the Most Powerful Business Software Ever!

TRS-80® (Model I, II, III, or 16) • APPLE™ • IBM™ • OSBORNE™ • CP/M™ • KAYPRO™



FREE--TRS-80 Mod I, III & 4 programs supplied on DosPlus (minimum system). Complete DosPlus also available.

The VERSABUSINESS™ Series

Each VERSABUSINESS module can be purchased and used independently, or can be linked in any combination to form a complete, coordinated business system.

VERSARECEIVABLES™

\$99.95

VERSARECEIVABLES™ is a complete menu-driven accounts receivable, invoicing, and monthly statement-generating system. It keeps track of all information related to who owes you or your company money, and can provide automatic billing for past due accounts. VERSARECEIVABLES™ prints all necessary statements, invoices, and summary reports and can be linked with VERSALEDGER II™ and VERSAINVENTORY™.

VERSAPAYABLES™

\$99.95

VERSAPAYABLES™ is designed to keep track of current and aged payables, keeping you in touch with all information regarding how much money your company owes, and to whom. VERSAPAYABLES™ maintains a complete record on each vendor, prints checks, check registers, vouchers, transaction reports, aged payables reports, vendor reports, and more. With VERSAPAYABLES™, you can even let your computer automatically select which vouchers are to be paid.

VERSPAYROLL™

\$99.95

VERSPAYROLL™ is a powerful and sophisticated, but easy to use payroll system that keeps track of all government required payroll information. Complete employee records are maintained, and all necessary payroll calculations are performed automatically, with totals displayed on screen for operator approval. A payroll can be run totally, automatically, or the operator can intervene to prevent a check from being printed, or to alter information on it. If desired, totals may be posted to the VERSALEDGER II™ system.

VERSAINVENTORY™

\$99.95

VERSAINVENTORY™ is a complete inventory control system that gives you instant access to data on any item. VERSAINVENTORY™ keeps track of all information related to what items are in stock, out of stock, backorder, etc., stores sales and pricing data, alerts you when an item falls below a preset reorder point, and allows you to enter and print invoices directly or to link with the VERSARECEIVABLES™ system. VERSAINVENTORY™ prints all needed inventory listings, reports of items below reorder point, inventory value reports, period and year-to-date sales reports, price lists, inventory checklists, etc.

VERSALEDGER II™

\$149.95

VERSALEDGER II™ is a complete accounting system that grows as your business grows. VERSALEDGER II™ can be used as a simple personal checkbook register, expanded to a small business bookkeeping system or developed into a large corporate general ledger system without any additional software.

- VERSALEDGER II™ gives you almost unlimited storage capacity (300 to 10,000 entries per month, depending on the system),
- stores all check and general ledger information forever,
- prints tractor-feed checks,
- handles multiple checkbooks and general ledgers,
- prints 17 customized accounting reports including check registers, balance sheets, income statements, transaction reports, account listings, etc.

VERSALEDGER II™ comes with a professionally-written 160 page manual designed for first-time users. The VERSALEDGER II™ manual will help you become quickly familiar with VERSALEDGER II™, using complete sample data files supplied on diskette and more than 50 pages of sample printouts.

SATISFACTION GUARANTEED!

Every VERSABUSINESS™ module is guaranteed to outperform all other competitive systems, and at a fraction of their cost. If you are not satisfied with any VERSABUSINESS™ module, you may return it within 30 days for a refund. Manuals for any VERSABUSINESS™ module may be purchased for \$25 each, credited toward a later purchase of that module. All CP/M based Computers must be equipped with Microsoft BASIC (MBASIC or BASIC 80).

To Order:

Write or call Toll-free (800) 431-2818
(N.Y.S. residents call 914-425-1535)

- add \$3 for shipping in UPS areas
- add \$4 for C.O.D. or non UPS areas

* add \$5 to CANADA or MEXICO

* add proper postage elsewhere



DEALER INQUIRIES WELCOME

All prices and specifications subject to change. Delivery subject to availability.

50 N. PASCACK ROAD, SPRING VALLEY, N.Y. 10977

TRS-80 trademark Tandy Corp. APPLE trademark Apple Corp. IBM PC trademark IBM Corp. OSBORNE trademark Osborne Corp. XEROX trademark Xerox Corp. KAYPRO trademark Non-Linear Systems, Inc. TELEVIDEO trademark Televideo Systems, Inc. SANYO trademark Sanyo Corp. NEC trademark NEC Corp. DEC trademark Digital Equipment Corp. ZENITH trademark Zenith Corp. TI PROFESSIONAL COMPUTER trademark Texas Instruments, Inc. SUPERBRAIN trademark Interact Corp. CP/M trademark Digital Research. EPSTON trademark Epson Corp.

ANYONE CAN USE OUR SOFTWARE!



MAIL PAC II and CHECKING PLUS represent a new generation of computer software. Our software doesn't even need a manual! Anyone can quickly learn to use either package by following simple, explicit on-screen instructions. But, for those of you who insist -- we've included a complete user's manual as well.



MAIL PAC II FEATURES:

High Capacity --

Stores from one to one million names in Zip Code, Numerical or Alphabetical order. The only limitation is your disk storage space.

Flexibility --

Prints your mailing list on 1, 2, 3, or 4-across labels (with up to 5 user-defined lines on each label) or as a compact, user-designed directory. The record length is completely user-defined, and each field within each of your records is completely variable (allowing storage of any number of characters for any particular address entry). Devote fields to telephone numbers, codes, or even special messages related to each particular name on file.

Powerful --

A built-in word processor allows you to create personalized form letters for each address on your list (or just a particular group of addresses).

Ease of Use --

Create new mailing lists, review existing lists, handle changes of address, delete cancelled names, sort lists, and purge duplicate names from your files. Complete on-screen instructions tell you in plain English exactly how to accomplish all of these tasks.

MAIL PAC II \$99.95

Both Programs Require 48K And At Least One Disk Drive (2 Drives For Higher Storage Capacities). And All Hard Disk Systems Are Supported.



CHECKING PLUS FEATURES:

Complete Check Register --

Checking Plus stores your entire check register in a disk file, and then uses the data to balance your account, track your expenses, and help you make budget projections. Review the entire checkbook, enter checks, deposits, fees and adjustments, mark outstanding checks when paid, and get an instant cash balance at any time. All data can be viewed onscreen or printed out in report form.

Tax Preparation --

Storage of monthly and yearly totals and other important information aids in income tax preparation, for your personal use or for your accountant.

Handles the Details --

Store names and addresses for frequently written checks, then print checks to fit standard window envelopes, eliminating the need for extra typing. You can even store any comment, explanation or other message (up to 255 characters) related to a particular check.

Automatic Monthly Bill Payments --

Enter amounts and names of payees for all of your fixed-cost monthly payments, and then sit back while the system automatically prints checks.

CHECKING PLUS \$99.95

FREE--TRS-80 Mod. I, II & 4 programs supplied on DosPlus (minimum system). Complete DosPlus also available.

FOR YOUR TRS-80® • APPLE® • IBM PC® • NEC® • OSBORNE® • XEROX® • KAYPRO® • TELEVIDEO® • ZENITH® • SANYO®
DEC® • TI PROFESSIONAL COMPUTER® • SUPERBRAIN JR.® • EPSON® • Any CP/M® Computer
CP/M-based Computers must be equipped with Microsoft BASIC (MBASIC or BASIC-80)

TRS-80 trademark Tandy Corp. • APPLE trademark Apple Corp. • IBM PC trademark IBM Corp. • ATARI trademark Atari Inc. • OSBORNE trademark Osborne Corp. • XEROX trademark Xerox Corp. • KAYPRO trademark Non Linear Systems Inc. • TELEVIDEO trademark Televideo Systems Inc. • ZENITH trademark Zenith Corp. • SANYO trademark Sanyo Corp. • NEC trademark NEC Corp. • DEC trademark Digital Equipment Corp. • TI PROFESSIONAL COMPUTER trademark Texas Instruments Inc. • SUPERBRAIN trademark Intertec Corp. • CP/M trademark Digital Research • EPSON trademark Epson Corp.

OUR SOFTWARE CATALOG

H & E Computronics, Inc., has mailed more than 1 million software catalogs since 1978. Send \$2 for our new 64-page catalog today! (We also send you our catalog FREE with every order). DEALER INQUIRIES WELCOME

30-DAY MONEY BACK GUARANTEE

*** ALL PRICES & SPECIFICATIONS SUBJECT TO CHANGE ***
DELIVERY SUBJECT TO AVAILABILITY

COMPUTRONICS

50 N. PASCACK RD., SPRING VALLEY, N.Y. 10577

ADD \$3.00 FOR SHIPPING IN UPS AREAS
ADD \$4.00 FOR C.O.D. OR NON-UPS AREAS
ADD \$5.00 TO CANADA & MEXICO
ADD PROPER POSTAGE OUTSIDE OF U.S.
CANADA & MEXICO



24 HOUR ORDER LINE
(914) 425-1535

NEW TOLL-FREE ORDER LINE
(OUTSIDE OF NY & NJ)
(800) 431-2818

DOSPLUS

*Experience
the
Power*

"Awesome". The word only begins to describe the power of DOSPLUS 3.5, the latest in the line of popular Disk Operating Systems from Micro-Systems Software, Inc.

Long known for its production of high quality, user friendly operating systems, Micro-Systems Software introduces a whole new breed of DOSPLUS. Version 3.5 explores avenues of power and flexibility previously untouched in TRS-80 DOS.

DOSPLUS 3.5 is the last word in professionally crafted operating systems and combines un-

limited power and flexibility with the same reliable and steady performance you have come to expect from the name DOSPLUS. In short, DOSPLUS puts you in total control. From its parameter rich library, to the many and powerful utilities, to the full featured BASIC, DOSPLUS is THE system for the TRS-80 Model I or III.

Priced at \$149.95, DOSPLUS gives your micro-computer mainframe power without mainframe price. Order yours today and experience the power...DOSPLUS!

- DOSPLUS 3.5's total device independence and completely external device structure allow interface to almost ANY kind of peripheral. Support will be given for hard disks, printers, and non-standard floppy drives.
- In addition, DOSPLUS 3.5 offers many utilities including a menu driven user interface that allows file manipulation at the touch of a key, full file and disk editing utilities, and a directory check utility with optional repair. Standard utilities let you map file locations, restore killed files, or offset file locations in memory.
- DOSPLUS 3.5 also includes one of the best Disk BASIC interpreters available with any DOS. With exclusive features like controlled screen formatting and label dd-

dressing, DOSPLUS BASIC puts you a step ahead. Single step debugging, global text editing, program cross referencing, and a multi key/multi array sort are all standard.

• The DOSPLUS 3.5 manual will set new standards in documentation. Almost 400 pages of clear, easy reading text that will acquaint you with all areas of system operation. The user's manual is written in English instead of "computerese" and is aimed at both the novice and the experienced user alike. The technical manual clearly documents every part of the system and will prove a gold mine to programmers seeking to interface with DOSPLUS.

MICRO-SYSTEMS SOFTWARE, INC.
4301-18 Oak Circle, Boca Raton, Florida 33431, Telephone: (305) 983-3390
Orders Only 1-800-327-8724



ONE



FOR ALL

ONE • IBM-PC • APPLE II • TRS-80 • R

Percom Data Corporation has one hard disk drive system for just about all personal computers including Apple™, IBM™ PC, APPLE™ II, and TRS-80™. Percom Data's innovations with 5 1/4" Winchester technology mean that for most personal computers having a reliable hard disk system is as easy as having a 3 1/2" disk.

A Percom Data PHD™ will interface with your present system... and your future system. If you change computers, you can still keep your most important investment - your Percom Data Hard Disk Drive.

Because Percom Data helped create the industry standards of today... new designs in software and hardware will make your selection of a Percom Data Hard Disk Drive pay off tomorrow through system compatibility.

A Percom Data PHD works so easily because we take the time to correctly develop interface software to your computer which leaves no performance holes for you to fall into. Percom Data knows software functionality is the key to hardware performance. Today Percom Data PHD supports a variety of software to match your computer:

IBM™ PC, PC DOS™ 1.1 OR 1.0

CPM-80, CONCURRENT CPM-80

APPLE™ DOS 3.3, CPM™

TRS-80™ MODELS III & I, DPLUS, LDOS

IMAGINE Percom Data Winchester 5 1/4" technology for today's computers and tomorrow's.

To receive an informative booklet describing Percom Hard Disk Systems or to determine if we have a system for your computer call our Hard-Line Hot-Line at 1-800-527-1222.

We will also give you the name of a nearby authorized Percom Data Distributor. Inquiries are welcome.

PERCOM DATA
CORPORATION

Expanding Your Peripheral Vision

DRIVES • NETWORKS • SOFTWARE

(214) 340-7081 • 1-800-527-1222 • TELEX 73-0401 (PERCOM)

IBM, PC, PC DOS, CPM, CPM-80, TRS-80, MODELS III & I, DPLUS, LDOS, and PERCOM are registered trademarks of their respective companies. APPLE is a registered trademark of Apple Computer, Inc. PHD is a registered trademark of Percom Data Corporation.

80 Contents

Features

74. **The Business of Planning**
Don't be a financial gambler—use Monte Carlo analysis to defeat business problems.
Ronald A. Cengro



128. **Project Assessment Technique**
Calculate the rate of return and plan business alternatives.
David A. Plyer

152. **Business Bazaar**
A buyer's guide to profitable software.

180. **Satellite Word Processing**
Use CoCos as terminals while your Model I/III/4 handles the printing chores.
Henry Aldrich

184. **Spacemap**
A track-by-track disk directory for Model I owners.
Hubert C. Borrman

220. **80 Micro's Second Annual Reader's Choice Awards**
Your chance to pick the winners in TRS-80 software.

230. **Talk to the Big Guys**
Use this dumb terminal program to say hello to minis and mainframes.
Douglas Payne

Articles

Business

108. **What's the DIF?**
Access VisiCalc tiles from Basic for error-free reports.
David G. Haan
140. **Financial Transactions Recorder**
A Model II/12/16 data base that organizes and tallies your business deals.
Jim Barbarelo

Graphics

208. **The Artful Plotter**
The Radio Shack plotter/printer struts its stuff.
Jerry O'Dell

Hardware

272. **Portable Word Processor**
The Sony Typewriter and your Model III make a powerful combination for writing on the run.
Thomas Hartmann

Review

120. **The Versatile Microprint**
A printer that combines the best features of dot-matrix and near-letter-quality machines.
Bradford N. Dixon



Model II/12/16

140. **Financial Transactions Recorder**
268. **File Transfer Utility**
332. **Take II**

200. **The LDOS Toolbox**
Powersoft adds utilities and patches to the popular operating system.
Jim Held

Technique

116. **Saving Strings**
Even the fastest typist can't outrun this INKEY\$.
David M. Keil

Tutorial

216. **Aid for AIDS-III**
Getting the most from the March issue's data base manager.
Anne Eisenberg

Utility

268. **Mod II File Transfer Utility**
Tell your micro to move files, then leave while the work gets done.
J.H. Nestor

Departments

6. **Remarks**
Anatomy of a merger.
Wayne Green
10. **Proof Notes**
Coming to terms with terminology.
12. **Input**
Replacements versus copies. Alarms and switches. Motorola on the MC68020. Bigger barriers. Print and LPRINT. Model II spooling. Lower bombing runs. More on WittSoft. Forcing programmers away from Basic.
20. **Aid**
Model I speedup. Advertising software. Electric Pencil lowercase. Alcor Pascal assistance.
22. **Debug**
Fixes, patches, corrections, and amendments.
24. **The Next Step**
Low memory and restart vectors.
Hardin Brothers

80 Contents

- 30. The Color Key**
Plot your expenses with this CoCo graph program.
Scott Norman

- 38. Reviews**
The MC-10, a CoCo for beginners. Liberator. Computer Programming for Kids. The Executive Calculator. Model II games. Maxi Stat. The Home Accountant. Forms III/Prosor III. Optimal Manager. Games at a Glance.



- 71. Review Digest**
Outside opinions of the TRS-80 marketplace.

72. Calendar

- 280. C Notes**
A portable disassembler, elapsed-time clock, foreign exchange, and tips on writing your own Model 100 conversions, plus an update for would-be fliers.

- 292. News**
CP/M and the software outlook. The stringy floppy forgets its past. Tandyvision: in and out of the video biz. Micros in hotels. The Model I in museums. June in Massachusetts.

- 304. The Gamer's Cafe**
Investing in Florida real estate.
Rodney Gambucus



- 308. Feedback Loop**
Our columnist fields your questions.
Terry Kepner

- 320. Reload 80**
Making business software decisions.
Ameen Eisenberg

- 324. Fun House**
Back to school, Fun House style.
Richard Remella

- 331. Young Programmer's Contest**
How to enter the second annual extravaganza.

- 332. Take It**
A Model II mailing list.

- 338. New Products**
Multi-color plotters. Alone with Floyd. Self-cleaning disks. Model 4 upgrade. Z80 applications. VisiCalc and CP/M tips. Text-formatting spreadsheet. Model 100 and RS-232 bar code readers. Power console. Use CoCo disks on your I/III.

PUBLISHER/PRESIDENT
Wayne Green
EXECUTIVE VICE PRESIDENT
Sherry Smythe-Green
ASSISTANT TO PRESIDENT
Matt Smith
VICE PRESIDENT/GENERAL MANAGER
Debra Wetherbee
ASSISTANT PUBLISHER
Jeff DeTray
VICE PRESIDENT/FINANCE
Roger Murphy
ASSISTANT TO VP/FINANCE
Dominique Smith
CIRCULATION MANAGER
603-924-9471
Patricia Ferrante
BULK & NEWSSTAND SALES MANAGER
Ginnie Boudreau
ADVERTISING, 603-924-7138
Director of Advertising: David Schlesier
Sales Manager: Denis Duffy
Sales: Edward Borezo, Mary Hanwell
Ad Coordinator: Betty Butler

PRODUCTION
Manager: Nancy Salmon
Assistants: Michael Murphy
David Wozniak,
Michael Ford, Phil Geraci,
Marjorie Gillies, Kimberly Nadeau,
Lynn Parsons, Anna Rocchio,
Kenneth Sutcliffe, Karen Wozniak,
Film Production: Donna Hartwell,
Theresa Verville, Robert M. Villeneuve,
Ad Coordinators: Patricia Bradley,
Paula Ramsay; Assistant: Taylor Morris,
Advertising Production: Jane Preston,
Flora Davies, Bruce Hedin, Scott Phibbs
PHOTOGRAPHY
Supervisor Thomas Villeneuve;
Sandra Dukette, Lauri Jamison,
Sturdy Thomas, Irene Vail
TYPESETTING
Supervisor: Sara Bedell; Darlene Bailey,
Laurel Beckman, Prem Gongaju,
Lynn Haines, Debbie Nutting,
Lindy Palmisano, Heidi Thomas,
Sue Weller
DESIGN
Supervisor Joyce Pittarelle;
Susan Donghoe, Howard Happ,
Beth Krommes, Glyn Owans,
Dianne Ritson, Patrice Scribner,
Susan Stevens, Donna Wohlmann,
Copywriters: Louis Marin, Gail Morrison,
Gale Tietjen
DESIGN DIRECTOR
Christine Desremps

The left bracket, [, replaces the up arrow used by Radio Shack to indicate exponentiation on our printouts. When entering programs published in 80 Micro, you should make this change.

80 formats its program listings to run 64-characters wide, the way they look on your video screen. This accounts for the occasional wrap-around you will notice in our program listings. Don't let it throw you, particularly when entering assembly listings.

Article submissions from our readers are welcomed and encouraged. Inquiries should be addressed to: Submissions Editor, 80 Pine Street, Peterborough, NH 03458. Include an SASE for a copy of our writers' guidelines. Payment for accepted articles is made at a rate of approximately \$50 per printed page; all rights are purchased. Authors of reviews should contact the Review Editor, 80 Pine Street, Peterborough, NH 03458.

***TRS-80, Scripsit, and TRSDOS are trademarks of Tandy Corp.**

Cover by Chris Demarest



Manuscripts are welcome at 80 Micro. We will consider publication of any TRS-80 oriented material. Guidelines for budding authors are available. Please send a self-addressed envelope and ask for "How to Write for 80 Micro." 80 Micro is published monthly by 100101 Inc., a subsidiary of Wayne Green Inc. No part of the publication may be reproduced, or reprinted by any means, without prior written permission from 80 Micro publisher. All programs are published for personal use only. All rights reserved.

80 Micro (ISSN 0744-7988) is published 12 times a year by 100101 Inc., 80 Pine St., Peterborough, NH 03458. Second class postage paid at Peterborough, NH, and additional mailing offices. Subscriptions: U.S. and \$25 for one year and \$53 for three years. In Canada and Mexico \$27/yr.—one year only. U.S. funds drawn on a U.S. bank. Canadian distributor: Greymer Data Services, Ltd., #4 258 E. 1st Ave., Vancouver, BC V6T 1A6. Foreign subscriptions (surface mail), \$44/yr.—one year only. U.S. funds drawn on a U.S. bank. Foreign subscriptions (air mail), please inquire. In South Africa contact 80 Micro, P.O. Box 782815, Sandton, South Africa 2146. All U.S. and Canadian subscription correspondence should be addressed to 80 Micro, Subscription Department, P.O. Box 981, Farmington Hills, MI 48336. Please include your address label with any correspondence. Postmaster: Send form 3579 to 80 Micro, Subscription Services, P.O. Box 981, Farmington Hills, MI 48336.

REMARKS

by Wayne Green

In a way, I suppose you might say I sold out, but I plead guilty with an explanation. And by the way, if you're interested in joining a fast-rising firm, you could do worse than read on.

It all started this last spring when some chaps from one of the bigger banks called saying that they had a large foreign publisher who was looking to acquire something like my micro publishing empire. I wasn't much interested because I enjoy what I'm doing more than anything else I can imagine. But what would it cost to listen, right?

So they came to visit and looked over our place. I showed them our growth in sales, which has run around 50 percent a year for the last eight years, limited only by all growth being 100 percent self-financed. They mumbled vaguely about \$50 million, which I have to admit got my attention. I'd really never given much thought to what the whole mess might be worth.

The word that I was thinking of selling began to spread and new suitors started calling every few days. The more I talked with these firms, the more I realized that this probably was a good time to merge with a larger firm, to give me the money to invest in some new projects. I never had much of a personal need for money, so selling out for



Green sells out

a big bundle of cash had little attraction.

No, it would be worth merging if I could get the money to start magazines at a faster rate and thus be able to better keep up with the needs of the micro-

computer industry. And I had an idea for a new type of magazine I wanted to try out. If it worked, I'd have a way to get perhaps 50 more like it going, each with expected sales on the order of \$5 million a year or more.

Then there was my idea of a new type of school, a business/technical institute geared to the needs of the 80s. The more I thought about it, the more ideas for new divisions of Wayne Green Inc. came to mind. With some cash available for getting these new businesses and publications going, we could step up our growth enormously. I did some sales projections and I could see us growing to \$1 billion in sales within 10 years, just on the plans already in mind.

As I talked with the firms interested in merging, I found several of them excited about my ideas and plans. I've got a good record of coming up with innovative ideas, so there wasn't much skepticism.

The final choice of merger partner was most difficult. Several large firms put it bluntly: They needed me and I could name my price. Now, I want to tell you, that is fantastic for the ego. I really wasn't into shopping around for the highest offer because the difference between \$50 million and \$100 million is a lot less than the compatibility of the merger. And numbers like that don't mean anything anyway—they're just very big numbers.

On May 22 I signed a preliminary agreement with Pat McGovern. He's the publisher of *Computerworld*, *InfoWorld*, and so on... several times the size of my firm in sales. The date was significant to me because it was eight years to the day from when I called the editor of a small micro newsletter to come up and discuss starting a magazine... and we agreed to give it a try. Five weeks later the first issue of *Byte* went to the printer.

The merger means that we'll be able to do more promotion of our current magazines. It means we'll be able to start more magazines—and I have a bunch of them all planned out. Each magazine is going to require a staff, so we'll be looking for programmers, people for advertising sales, typesetting,

SUPERSCRIPSIT PRINTER DRIVERS

With an ALPS printer driver (software), you can attach your printer to the Superscripsit word processor. Over 45 printers now supported. Call, write, or circle reader number for latest Product Review Sheet.

Epson MX-80 and MX-100 / Graftrax-Plus / FX-80
C.Itoh ProPrinter (8510) / F-10 / FP-1500-25
Qume Sprint V / INS Prism / Microprint
Olympia ESW 102,103,3000 / ES 101,105
NEC 8023 / Spwriter 5530,7730,3530
Diablo 630,1610,1620 / DTC 3802
\$49

Okidata Microline 82, 83, 84, 92, 93, 8452
Smith-Corona TP-I / Gemini 10,15 / AJ 831
Byewriter / Olivetti ET121 / Brother HM-1
R.S. Line Printer V / DNI / Man.Tally 160
Adler 1010,1030 / Royal 5010,5030 / Comrex CB-1
\$49

Serial Interface Program for Serial Printers \$19
Can be used for applications other than SCRIPSIT

Mail / Phone Orders Accepted

ALPS

23 Angus Road
Warren, New Jersey 07060
201-647-7230



SLICK PAGES? NO! GREAT DEALS? YES!



Computer Shopper pages aren't slick because they were designed for one purpose: to put buyers in touch with sellers at the lowest possible cost. This resulted in bargains on new and used equipment and software.

Individuals nationwide are able to list their pre-owned items for only a few dollars. This created hundreds of classified ads in over 100 big 11x14 pages.

And to make sure there were enough buyers for advertisers, the subscription price was set low, too!

So strike your first deal by taking advantage of this special trial subscription offer: today! 6 months, \$6 or 12 months, \$10. Money back guarantee. MasterCard and VISA accepted.

COMPUTER SHOPPER

P.O. Box F584 • Titusville, FL 32780

305-269-3211

• 39

THE SWITCH

SWITCH TO 5¹/₈" DOUBLE DENSITY

LNDoubler 5/8

FEATURES

- 5- and 8-inch* disk drives
- Single- & double-density
- Any size and density in any mix
- Read Model I, II* and III disks
- 5- or 8-inch* system disk
- Single & double sided disk drives
- DOS+ 3.3.9 included, with Disk BASIC.
- 6 month warranty
- Up to 3.75 megabytes online
- Easy installation - plug-in & run
- Analog phase lock loop data separation
- Precision write precompensation
- Regulated power supply
- Guaranteed operation at 4MHz
- All contacts gold plated
- Solder masked & silk screened
- Runs under DOS+ 3.3.9, TRSDOS 2.3, NEWDOS 2.1, NEWDOS/80 1.0, LDOS, NEWDOS/80 2.0, and ULTRADOS
- Reads 40- and 35-track disks on 80-track drives
- FD1791 controller + your FD1771
- Fits Model I expansion interfaces
- Fits LNW expansion interfaces
- Track configurations to 80-tracks
- 5 inch disk storage increased to:
161,280 bytes - 35-track SS/DD
322,560 bytes - 35-track DS/DD
184,320 bytes - 40-track SS/DD
368,640 bytes - 40-track DS/DD
- 8 inch disk storage increased to:
368,640 bytes - 80-track SS/DD
737,280 bytes - 80-track DS/DD

591,360 bytes - 77-track SS/DD
1,182,720 bytes - 77-track DS/DD
SS: single-sided DS: double-sided
SD: single-density DD: double-density

COMPLETE - The *LNDoubler 5/8*, switches your Model I or LNW-80 into the most versatile computer you can own. The *LNDoubler's* switch allows you to boot from 5- or 8-inch system disks, and it's accessible from outside the interface. The *LNDoubler 5/8* comes with a double-density disk operating system (DOS+ 3.3.9), complete with BASIC and utility programs . . . ready to run your software NOW!

VERSATILE - Whether you want single-sided, double-sided, single- or double-density, 5- or 8-inch operation, complete versatility is here today! Any combination of 5- and 8-inch disk storage is possible with the *LNDoubler 5/8*. Each of your present 40-track, single-sided 5-inch drives will store up to 184,320 bytes (formatted storage) - that's an 80% increase in storage capacity for only half the cost of just one disk drive. With three 8-inch double-density, double-sided drives your Model I will have 3.75 Megabytes of online storage - that's more storage than a Model II or Model III!

ADVANCED - The *LNDoubler 5/8* is the most technically advanced, tested and reliable double-density

board you can buy. The *LNDoubler 5/8* has more features, more options and more software support than any other product of its kind.

EASY TO INSTALL - The *LNDoubler 5/8* is easy to install. There are no traces to cut, no wiring to do, just a screwdriver and a few minutes of your time is all that is required. The instructions are fully illustrated for all interfaces. In minutes you will be 'up-and-running', and enjoying your computer as never before.

COMPARE - Compare features, compare quality, compare value, and make the **SWITCH** today!

Immediate delivery from stock - at your dealer **NOW** for only

\$ 219.95

DEALERS - You too can make The Switch.



LNW RESEARCH CORPORATION

2620 WALNUT Tustin, CA. 92680 (714) 544-5744 (714) 641-8850

*8" drive operation requires special cable, 8" double-density requires 3.65MHz CPU speed-up modification or LNW-80 4MHz computer

TRS-80 is a trademark of Tandy Corporation.

REMARKS

graphics arts, circulation, data processing, and so on.

Then there are a number of special projects, such as my planned technical/business college. We're going to need management teams to get these projects going and to run them. Most of this is going to be done in New Hampshire, but eventually we'll be growing in other areas of the country.

If you're interested in getting involved with some exciting new ideas, you should get a letter off to me telling me what you think you might be able to do. I'm looking right now for non-smokers with a history of enthusiasm and the ability to make things happen with a minimum of supervision.

There won't be any astronomical salaries as we start new projects, but we plan to make it well worth the while of those who are the most helpful in starting these new ventures.

For instance, I have a number of products that I'd like to have made in Asia and import for sale here. I've got the

contacts in Asia to handle that end, but I need the people to handle the project from the New Hampshire end—setting up the advertising, importation, and distribution of the products. This should grow into a substantial business by itself.

Why New Hampshire? Well, mostly because this is one of the best places in the country to live. The quality of life is wonderful and the cost of living far less than New York or Silicon Valley. We still don't have any state sales or personal income taxes in New Hampshire. We're in a small town with all of the advantages of a small town. The people are friendly and the crime rate is low.

If you're looking for the chance of a lifetime to get in on some new projects... and if you think you can hack it... let me know. You're going to have to prove you can get things done. We have no free rides here, just a bunch of enthusiastic people all having the times of their lives working hard and turning out first-rate products. We're working

out of old houses, converted motels and barns, and so on. This is not IBM.

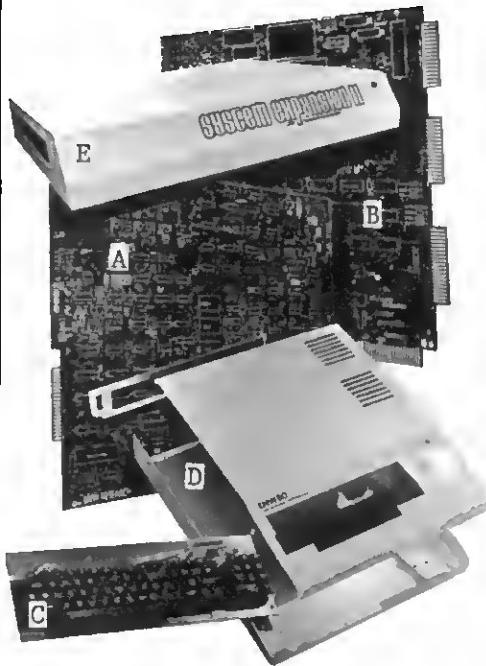
You can be old, young, black, white, red, brown, male, female, undecided, but if you smoke please don't bother me, okay? The air up here is invisible and we want to keep it that way.

The merger means that we have a guarantee of the money we need to move ahead on as many projects as I can find teams to work on. And if we run out of projects to get started, I'll have more. I come up with an idea for a good solid project every few days.

When you think about it, by the time you put my six magazines together with those Pat is already publishing, we're a very strong combination. I think we'll be able to parlay this group into a pilot model of the college of the future, into perhaps an educational satellite television network... things like that.

Pat is much like I am—full of ideas and enthusiasm. I think we're going to really make things hum in the micro-computer field. Care to join us? ■

COMPUTER KITS - FROM \$69.95



LNW SEMI-KITS can save you hundreds of dollars. By obtaining your own parts at the lowest possible cost and assembling the **LNW SEMI-KITS**, you can have the most highly acclaimed microcomputer in the industry—the **LNW80**. The **LNW SEMI-KITS** are affordable modules. You can start with a modest cassette system and expand to a full 4MHz TRS-80 compatible system with 5 or 8 inch double density disks and color at any time.

A. LNW80 CPU - Made of high quality FR4 glass epoxy double sided circuit material, with plated-through holes and gold edge connector. It is fully solder-masked and silk screened. Here are just some of the outstanding features you will have when your **LNW80** CPU board is fully assembled:

- 16K RAM • Color and black and white video • 480 x 192 high resolution graphics • 64 and 80 column video • 4 MHz Z80A CPU • Upper and lower case display • 500 and 1000 baud cassette I/O - **\$89.95**

B. SYSTEM EXPANSION - Expand the **LNW80** computer board, TRS-80 and PMC-80 computer with the following features:

- 32K memory
- Serial RS232C and 20mA port
- Real time clock
- Parallel printer port
- 5 inch single density disk controller
- Expansion bus (screen printer port)
- Onboard power supply
- Solder-masked and silk screened legend - **\$89.95** (tin plated contacts) - **\$84.95** (gold plated contacts)

C. KEYBOARD - 74 key expanded professional keyboard - includes 12 key numeric keypad. Fully assembled and tested - **\$99.95**

D. COMPUTER CASE - This stylish instrument-quality solid steel case and hardware kit gives your **LNW80** that professional factory-built appearance. - **\$84.95**. Add \$12.00 for shipping.

E. SYSTEM EXPANSION CASE - This stylish instrument-quality solid steel case and hardware kit gives your **SYSTEM EXPANSION** interface that professional factory-built appearance. - **\$59.95**. Add \$10.00 for shipping.

F. LNW80 CPU - HARD TO FIND PARTS KIT - **\$22.00**

G. LNW80 VIDEO - HARD TO FIND PARTS KIT - **\$31.00**

H. SYSTEM EXPANSION - HARD TO FIND PARTS KIT - **\$27.50**

I. LEVEL II ROM set (6 chip set) - **\$120.00**

VISA and MasterCard accepted. Add \$3.00 for shipping plus \$1.00 for each additional item. All shipments via UPS surface. Add \$2.00 for U.S. Mail. Shipments outside continental U.S.: funds must be U.S. dollars. Sufficient shipping costs must be included with payment.

ORDERS & INFORMATION - (714) 544-5744
SERVICE - (714) 841-8850

LNW Research Corp.
2620 WALNUT Tustin, CA. 92680

MICRO DATA SUPPLIES

22295 Euclid Avenue Euclid, Ohio 44117

FOR ORDERS ONLY CALL 1-800-321-3552

IN OHIO and all other inquiries call (216) 481-4993



PLUS COMPATIBILITY WITH MOST SOFTWARE PACKAGES THAT SUPPORT LEADING PRINTERS AND A LIST PRICE WELL BELOW COMPARABLE, COMPETITIVE MODELS... CALL FOR QUOTES

**THE GEMINI SERIES—
FOR ASTRONOMICAL VALUE
AT DOWN-TO-EARTH PRICES**

PRACTICAL PERIPHERALS **MICROBUFFER™ IN-LINE**

FOR ALL COMPUTER/PRINTER OR COMPUTER/MODEM COMBINATIONS

MICROBUFFER IN-LINE

32K Parallel	\$289.00
64K Parallel	\$339.00
32K Serial	\$289.00
64K Serial	\$339.00
64K Memory Expansion Modules	\$169.00

MICROBUFFER/E

MBP-16K Parallel	\$149.00
MBP-32K Parallel	\$189.00
NEW! MBP-64K Parallel	\$289.00
MBS-8K Serial	\$149.00
NEW! MBS-16K Serial	\$169.00
NEW! MBS-32K Serial	\$209.00

ELECTRONIC PROTECTION DEVICES

The PLUM—3-way EMI-RFI AC Power Line Noise Filter (wall outlet)	\$ 49.95
The LEMON—6-way Surge Suppressor for AC Power Lines (wall outlet)	\$ 54.95
The LIME—Same as LEMON, w/5 ft cord & on-off switch	\$ 79.95
The PEACH—6-way Surge Suppressor, EMI-RFI Line Filter (wall outlet)	\$ 89.95
The ORANGE—Same as LIME w/EMI-RFI Filtering PLUM & LIME Combined	\$1129.95
GRIZZLY 200—250 Watt Uninterruptible Power Supply (universal install.)	\$1495.00
GRIZZLY 750—750 Watt Uninterruptible Power Supply (universal install.)	\$1895.00

GEMINI 10**5 are trademarks of Star Micronics. TRS-80 is a trademark of the Radio Shack Division of Tandy Corporation. DATALIFE is a trademark of VERBATIM. PLAIN JANE, PARAGON MAGNETICS are trademarks of MTC

TO ORDER CALL
1-800-321-3552
IN OHIO
AND ALL OTHER INQUIRIES
(216) 481-4993

PRICES IN EFFECT
THRU
SEPT. 30, 1983
Prices, Specifications,
and Offerings subject to
change without notice
0983

WE ACCEPT
• VISA
• MASTER CHARGE
• CHECKS
• MONEY ORDERS
• C.O.D.

- Add \$3.00 for shipping & handling.
- \$2.00 EXTRA for U.S. Mail delivery.
- \$6.00 EXTRA for C.O.D.
- Ohio residents add 6.5% sales tax.

PARAGON Gold磁带机

MTC is now carrying its Paragon Gold™ Diskettes in both Single AND Double Sided, Soft AND Hard Sectored, all with reinforcement hub rings. Individually 100% ERROR-FREE certified. Invest in GOLD!

Paragon Plain Jane™ (15.SD)	\$19.95
Scorepac™	\$38.95
Paragon Gold (15.DD)	\$23.95
Paragon Gold (15.DD) 10 Sector	\$23.95
Paragon Gold (1S.DD)	\$46.95
Paragon Gold (2S.DD)	\$29.95
Paragon Gold (2S.DD) Scorepac™	\$56.95

ISN'T IT TIME YOU SCORED ...WITH SCOREPAC!™

Get a SCORE of diskettes in a sturdy, new PAC and SAVE! MTC's innovative, unique packaging concept for diskettes offers the best value in magnetic media today.

LIMITED TIME OFFER

Buy ANY SCOREPAC™ at its regularly advertised price and you're entitled to purchase a 5 1/4" File Box for the added cost of only \$17.95.* *Limit 1 File Box per SCOREPAC™

SCOREPAC™ w/20 Paragon Plain Jane™ Diskettes
1S/DD \$38.95

SCOREPAC™
w/20 Paragon Gold Diskettes
1S/DD \$46.95

SCOREPAC™
w/20 Paragon Gold Diskettes
2S/DD \$56.95



Verbatim

PREMIUM DISKETTES
AT AFFORDABLE
PRICES

DATALIFE™ VERBATIM DATALIFE™ DISKETTES

Seven data-shielding improvements mean greater durability and longer data life.

VERBATIM DATALIFE
DISKETTES
5 1/4-inch (box of 10)
MD525-01
15/D Den

SPECIAL!
\$25.95

5 1/4" 25/D Den (MD550-01)	\$39.95
5 1/4" 25/S Den (MD557-01)	\$51.50
8" 15/D Den (FD34-8000)	\$43.95



TRS-80 MODEL I EXPANSION \$349.00

- RS232C serial I/O
- Parallel printer port
- Gold-plated connectors
- Floppy disk controller
- Full 32K 200NS RAM
- Real time clock
- 6 month warranty
- Heavy steel case
- Thousands of users
- Works w/any DOS 100%

PROOF NOTES

The editors look at the issues

MANAGING EDITOR
Eric Maloney
SENIOR EDITOR (EDITORIAL)
Peter E. McKie
SENIOR EDITOR (PRODUCTION)
Deborah M. Sargent
NEWS EDITOR
Eric Grevstad
REVIEW EDITOR
Lynne M. Patnode
NEW PRODUCTS EDITOR
S.F. Tomajczyk
ASSISTANT EDITORS
Susan Bailey
Amy Campbell
Susan Gubernat
Robert L. Mitchell
Mary E. Ruth
EDITORIAL INTERN
Justina Alsfeld
TECHNICAL EDITORS
Bradford N. Dixon
Aimee Eisenberg (Load 80)
Mare-Anne Jarvela
Beverly Woodbury
PRODUCTION EDITOR
Susan Gross
LAYOUT EDITORS
Joan Ahern,
Bob Dukette, Maurelle Godoy,
Sue Hays, Laura Landy,
Judy Oliver,
Anne Vadeboncoeur
PROOFREADERS
Peter Bjornsen,
Harold Bjornsen,
Robin Florence, Ellen Hardsgog
EDITORIAL ADMINISTRATION
Carole Macloci

Editorial:
Send all correspondence to *80 Micro*, Pine St., Peterborough, NH 03458.

Subscriptions:

Problems with Subscriptions: Send a description of the problem and your current and/or most recent address to: *80 Micro*, Subscription Department, P.O. Box 981, Farmingdale, NY 11737.

Problems with Load 80 Circulation: Address correspondence to Lori Eaton, 80 Pine St., Peterborough, NH 03458.

Change of Address: Send old label or copy of old address and new address to: *80 Micro*, P.O. Box 981, Farmingdale, NY 11737. Please give eight weeks advance notice.

Microfilm: This publication is available in microform from University Microfilms International. United States address: 300 North Zeeb Road, Dept. P.R., Ann Arbor, MI 48106. Foreign address: 18 Bedford Row, Dept. P.R., London, WC1R4EJ, England.

Dealers: Contact Ginnie Boudrieau, Bulk Sales Manager, *80 Micro*, Pine St., Peterborough, NH 03458. (800) 343-0728.

The first cliche about computer buffs is that they carry pens in plastic shirt-pocket liners. The second is that they don't speak English.

Pocket-protector jokes belong to engineering, not computing; but the latter charge has some merit. Computer owners are famous for veering into jargon; indeed, anyone exposed to micros for any length of time begins speaking a kind of esoteric shorthand. Liberal arts graduates, taking entry-level positions at *80 Micro*, are initially baffled. Within days, though, they're striding through the office saying "Where's the RS-232 cable for the 4?" and "Anybody got a TRSDOS 1.3 I can back up?"

The advent of the computer age is no excuse for bad or stupid language—even if you have a terminal package and modem, you do not "interface" with people. But, in a magazine like *80*, the use of computer terms and abbreviations is not only appropriate but essential. To help readers who aren't familiar with some micro-oriented acronyms, we're introducing the glossary that appears below.

Fear of acronyms

It's by no means a definitive dictionary. Some mass-market computer magazines pepper their articles with asterisks, referring novices to a comprehensive glossary; we're more technically oriented than that, and decided to take "bit" and "disk" for granted. We may add some words as well as acronyms to the monthly list—"modem" was a strong contender in editorial meetings.

Tell us what you think of the idea. We don't want to insult our readers' intelligence, but we want *80* to be accessible to new TRS-80 fans as well as old ones. If it weren't an even worse cliche than the pocket protector, we'd say we want to be user-friendly. —E.G.

Glossary

ASCII	American Standard Code for Information Interchange. Character code that refers to the computer's internal recognition of letters, numbers, and symbols.	EPROM	such as DOSPLUS, NEW-DOS80, TRSDOS, and LDOS.
CP/M	Control Program/Monitor or Control Program for Microcomputers. A disk operating system produced by Digital Research.	K	Erasable Programmable Read Only Memory. Usually refers to a PROM that can be reused several times. It's erased with ultraviolet light and then programmed with a special PROM programmer.
CPU	Central Processing Unit. Computer module that retrieves, decodes, and executes instructions.	RAM	Kilobytes. 1K = 1024 bytes. Used in referring to computer storage capacity.
CRT	Cathode Ray Tube. The television tube used to display pictures or characters.	ROM	Random Access Memory. This is the primary storage area of a computer. The information in RAM is lost when power is disconnected.
DIP	Dual In-line Package. A standard integrated circuit package with two rows of pins at 1/10-inch intervals.	ROM	Read Only Memory. This information cannot be changed and is not lost when the power is off.
DOS	Disk Operating System,		

MICRO DATA SUPPLIES

22295 Euclid Avenue Euclid, Ohio 44117

FOR ORDERS ONLY CALL 1-800-321-3552

IN THE U.S. and HI THIS INCLUDES CALL (216) 481-3993

v14

INTRODUCING THE MOST POWERFUL
INFORMATION MANAGEMENT SYSTEM

EVER!



AN ALL NEW MACHINE LANGUAGE
VERSION OF THE WINNER OF THREE
80 MICRO READERS' CHOICE AWARDS...

AIDS III
Version 2.0



RUNS ON
TRSDOS • NEWDOS 80 • LDOS
AND MANY MORE!

AIDS III-V2.0 is more than a data management system, it is an information utility! AIDS III-V2.0 provides you with the capability of entering, organizing, isolating, and reporting facts, transforming data into information.

SATISFACTION GUARANTEED!

Every AIDS™ module is guaranteed to out perform all other competitive systems at a fraction of their cost. If you are not satisfied with AIDS™ for any reason, you may return it within 30 days for a refund.

Specify Model I, III or IV * \$79.95

CALCS-IV ONLY \$20 when purchased with AIDS-III/Version 2.0!

Specify Model I, III or IV * \$39.95

* Runs on Model IV 48K only.

SCHOOL & GOVERNMENT
PURCHASE ORDERS
ACCEPTED

TRS-80 is a trademark of the
Radio Shack Division of Tandy
Corporation. VisiCalc is a
trademark of Visi Corp.

AIDS is a trademark of Softronics

TO ORDER CALL

1-800-321-3552
IN OHIO
AND ALL OTHER INQUIRIES
(216) 481-4993

PRICES IN EFFECT
THRU

SEPT. 30, 1983

Prices, Specifications,
and Offerings subject to
change without notice
0983

- Add \$3.00 for shipping & handling.
- \$2.00 EXTRA for U.S. Mail delivery.
- \$6.00 EXTRA for C.O.D.
- Ohio residents add 6.5% sales tax.

WE ACCEPT

- VISA
- MASTER CHARGE
- CHECKS
- MONEY ORDERS
- C.O.D.

**NEWDOS/80
Version 2.0**



Model I and Model III

The hottest Disk Operating System is now available in its latest version. This is the ONE from Apparat, Inc., the people whose systems have made the TRS-80 the reliable computer.

\$139.95

NEWSRIPT 7.0

NEWSRIPT is the versatile TRS-80 word processing program. It supports "smart" printers like the Epson, Okidata, NEC, C.Itoh, Spinwriter, centronics 739 and more.

NEWSRIPT \$109.95

GEAP/Dotwriter

GEAP lets you create words and drawings quickly and easily, right on the screen of your TRS-80

"DOTWRITER" uses high-resolution "dot graphics" to create fancy lettersets.

Special:
GEAP AND DOTWRITER \$84.95

DATAGRAPH

Transform your VISI-CALC™ files into high-resolution custom graphs on your TRS-80™ computer and graphics printer. Super 3rd generation printer graphics program.

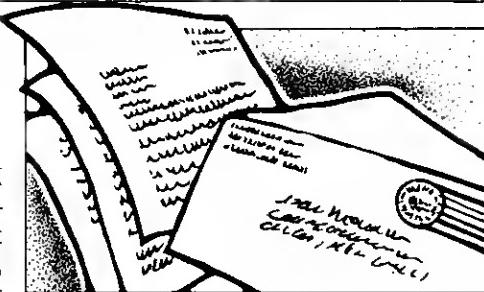
DATAGRAPH \$74.95

Let your TRS-80™ Test Itself With
**THE FLOPPY DOCTOR &
MEMORY DIAGNOSTIC**

by David Stambaugh

A complete checkup for your MODEL I or MODEL III. THE FLOPPY DOCTOR Version 3 completely checks every sector of single or double density 35-, 40-, 77-, or 80-track disk drives. Tests motor speed, head positioning, controller functions, status bits and provides complete error logging. THE MEMORY DIAGNOSTIC checks for proper write/read, refresh, executability and exclusivity of all address locations. Includes both diagnostics and complete instruction manual.

SYSTEM DIAGNOSTICS \$24.95
For MODEL III \$29.95



Scarfman Lives

When my copy of Scarfman died, I returned it to the manufacturer, Cornsoft Group, for a new copy. I didn't make a copy for myself or my friends, but respected the manufacturer's copyright.

When Cornsoft inadvertently sent me a replacement disk instead of a tape, I sent it back and quickly received the tape.

You see, software companies don't mind replacing media, they just don't want you to steal their programs. So use your copy as much as you want, but let's not ruin the chain of software that took so long to build.

Patrick Kellogg
10030 Heron Ave. N.
White Bear Lake, MN 55110

Author Turned Consumer

Much has been written recently about software piracy, disk copy protection, obtaining version updates, and the like. As a software author and consumer, I have contrasting views on the subject. Today I must put my author hat aside and take the side of the consumer.

For over three years I have been trying to get Radio Shack to do something about a bug in their Model I VisiCalc program. The problem has to do with the @EXP() function, and working around it makes calculating engineering and interest data awkward. Letters and phone calls have had little effect; refraining from future Radio Shack software purchases could constitute a partial loss of my original investment.

Last year I purchased the UltraPX data-base manager from CIE. In Janu-

ary, I ordered the upgrade and was informed that I must return the original to get the upgrade. CIE has since left the software marketplace leaving me with only stripped-down, working copies of the software. That is partly my fault since I failed to make a back-up copy prior to returning the disk.

Now, if some company chooses to pick up the product and offer upgrades, I no longer have the original software as proof of purchase. If someone can put me in touch with retired Col. Charles D. House (U.S. Air Force), author of UltraPX, I'd appreciate it.

Charles E. Burton
1720 S. DeFrame Court
Denver, CO 80228

Interfacing Computers

I think you should print more articles on interfacing computers to outside sources, such as burglar alarms, timers, or computer-controlled switches.

Also, could you give me the address of a Model III user's group or club in my area?

Paul Bukowski
217 Calkins Road
Palmer, MA 01069

You'll find a home-control project in our upcoming November issue. While you're waiting, you can get together with the folks at the Western Massachusetts Computer Club, 134 Breckwood Circle, Springfield, MA 01119.—Eds.

that the 68020 will be a full implementation of the 32-bit architecture, and will indeed have 32 address lines and 32 data lines, not the 24 address lines Mr. Fishman claims.

The Model I6's MC68000 has 24 address lines and a 16-bit data bus. Also, there is no such thing as an MC68032 currently in the works.

In addition to the full 32-bit architecture, the 68020 will have onboard cache, an enhanced instruction set, coprocessor operations, increased speed, and the virtual machine capabilities of the newly introduced 68010. The 68020 will be upward compatible with the 68000, 68008, and 68010.

Joe Jelemensky
MOS Microprocessor Design
Motorola Inc.
3501 Ed Bluestein Blvd.
Austin, TX 78721

Enlarge "Barrier" Display

I enjoyed "Barrier Level II" (Fun House, 80 Micro, May 1983, p. 362), but the invisible maze takes up only a third of the display screen. By enlarging the game screen to display size, I have made the game more difficult and more fun to play.

Try the changes in Program Listing 1 for more action.

Paul S. Marzovilla, Jr.
4602 Barnaby Court
Virginia Beach, VA 23455

Penpals Wanted

I'm a South African computer hobbyist looking for American penpals. I own a Spectrum (to you, a Timex-Sinclair 2000), and read 80 Micro regularly, trying to convert programs to run on my micro.

Werner Bredenhann
94 Gladstone St.
Parow, 7500
Cape Province, South Africa

Penetrator Eased

I bought Penetrator last year and found it to be a great game. My Model I Level II machine has the high-speed clock mod that turns on with an OUT

```
100 FOR X=0 TO 124
200 SET(X,Y+46)
230 FOR Y=0 TO 46
250 SET(X+124,Y)
270 SET(X+124,Y)
320 SET(122,42)
410 IF X$=D$ AND Y+4<43 AND
    POINT(X,Y+2)<>-1 THEN Y=Y+4
430 IF X$=R$ AND X+4<126 AND
    POINT(X+2,Y)<>-1 THEN X=X+4
450 IF X=122 AND Y=42 GOTO 470
```

Program Listing 1. Changes to enlarge the Barrier screen.

MC68020 Update

I just read with interest a letter from Mark P. Fishman published in your June 1983 Input column (p. 14). He stated that Jim Hawkes' article, "The Model I6," (80 Micro, February 1983, p. 228) contained errors regarding the Motorola MC68020.

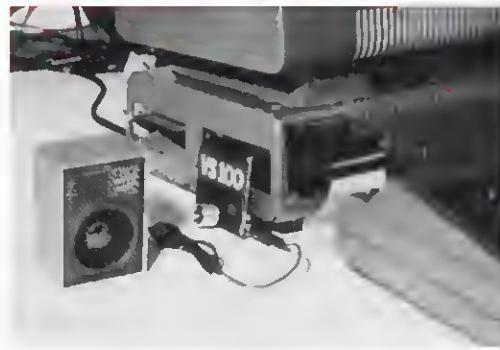
Mr. Hawkes was correct in stating

NOW IT'S TALKING VS 100

VOICE SYNTHESIZER
FOR MODEL I, III, IV
and Coco

- Unlimited vocabulary.
- Automatic inflection.
- Proven VOTRAX technology.
- We use the famous VOTRAX SC01 phoneme synthesizer. 4 programmable pitch level.
- Built in audio amplifier with volume control.
(The Color Computer version speaks through the TV speaker)
- You can add voice to any basic program in minutes.
- Super efficient: one single line in Basic will produce a full sentence!
- Works with any speaker (or add \$5.95 for handsome speaker module).
- Price breakthrough: same performance as units costing hundreds of dollars.
- Pronunciation dictionary included for hundreds of common words.
- Voice editor will help you create unlimited number of words, sound effects, etc..
- Hundreds of applications —now cost effective in education, robotics, speech therapy, monitoring, games, aid to handicapped, security, prompting....
- Fully assembled and tested,
90-Day warranty.
- Ready to plug in and talk.
- As usual our 15-day money back guaranty protects you.

\$ **69 95**



Order # C201 for MODEL I
C203 for MODEL III or IV
C205 for COLOR COMPUTER

Price includes SYNTHESIZER MODULE,
POWER SUPPLY, INSTRUCTIONS,
EDITING AND DEMO SOFTWARE. \$69.95
SPEAKER MODULE (not needed for coco
version) not included, add \$5.95

-----SUPER CONTEST-----

WIN \$1000 + ROYALTIES FOR THE BEST TALKING GAME
+ WIN \$1000 FOR THE BEST "SERIOUS APPLICATION" SOFTWARE
Send S.A.S.E. For contest details.

REVIEWERS: This is truly a remarkable product at an incredible price. We need your help to review it in all the major computer publications. Please send us a note if you are interested.

TIMEX SINCLAIR USERS:
There is a version for you.

Toll Free Order Line
800-221-0916

Orders Only, NY & Info call (212) 296-5916. Hours: 9-5 E.S.T.

Votrax is a registered trade mark of Votrax

CLUBS: Contact us at (212) 296 5916 if you would like to arrange for a product presentation.

 **ALPHA Products**
79-04 Jamaica Ave., Woodhaven, NY 11421 ✓ 17 ☎ (212) 296-5916

ADD \$2.50 PER ORDER FOR SHIPPING AND HANDLING.
WE ACCEPT VISA, MASTERCARD, CHECKS, M.O.
C.O.D. ADD \$3.00 EXTRA.
NY RESIDENTS ADD SALES TAX.
OVERSEAS, FPO, APO: ADD 10%.
DEALER DISCOUNTS AVAILABLE.



```
MEM SIZE? <ENTER>
R/S L2 BASIC
READY
>SYSTEM <ENTER>

*? P <ENTER>

*? <BREAK>
OUT 254,1: DEFINTX: FOR X=17408
TO 32766: IF PEEK(X)=211 AND PEEK(X+1)
=254 THEN POKE X,0:POKE X+1,0: NEXTX:
OUT 254,0 ELSE NEXTX: OUT 254,0 <ENTER>

>SYSTEM <ENTER>

*?/ <ENTER>
```

Program Listing 2. Changes that make Penetrator a more difficult game to play.

254,1 command. Since Penetrator includes this instruction in its code, the high-speed mod is turned on when the program runs and the game becomes very difficult to play.

Now when I want to play Penetrator, I type in Program Listing 2. The line PEEKs at locations from 17408 (the start of the program) to 32767 (the end of the program), and looks for the instruction OUT (FE), A. This outputs byte 1 to the port 254 (FEH). When it finds that opcode, it replaces it with NOPs.

Javier Henderson
Av. Belgrano 2449 #5
Piso Dept. C
1096 Buenos Aires,
Argentina

LPRINT Hints

I want to thank Jerry Lindsly for his article, "Drivers and DCBs," in your June 1983 issue. I recently purchased a 16K, cassette-based Model III. Until yesterday, I was unable to interface programs containing LPRINT statements to either my video screen or my printer at my one-key entry command. His identification of the DCB addresses for video and printer output were most helpful.

While that program lets you output programs containing LPRINT statements to the CRT, printer, or both, I prefer to use a five-line program at the beginning of my programs (which I update and print out daily).

This way, I can update my program, check it on my CRT for accuracy, and then print it. I do all of this without changing any LPRINT statements to Print commands. Program Listing 3 works on a 48K Model I with dual

drives. Program Listing 4 is written for a 16K, cassette-based Model III.

Henry P. Amelung
1205 Juniper Drive
Alamogordo, NM 88310

Spool It

I find the Spool command very helpful in making electrical job estimates on my Model II. I save the printouts for future reference, or to ensure that accurate specifications go to my supply houses. This spool file is sequential, and the sorting operation is done only once.

From TRSDOS, type SPOOL ON and press the enter key. Type SPOOL N,F=(file name), (drive number) and press the enter key. Then type and enter

BASIC - F:3, RUN(file name). All LPRINT statements go to the spool file.

Once the file is saved, get into Basic and type SYSTEM and press the enter key to return to TRSDOS. To close the spool file until you want to print it, type SPOOL OFF and press the enter key.

To print the spool file from TRSDOS, type and enter SPOOL ON, and then SPOOL P,F=(file name),K. The letter K saves the spool file for future use. Once the spool file is printed, close it again.

To see the file on screen before you print it, load TRSDOS and enter FORMS D, then DUAL ON.

This routes the spool file from the printer to the CRT. Return from TRSDOS to the printer by typing and entering DUAL OFF, and then FORMS.

While the spool file is printing, you can enter Basic and do other work. I use the library commands Forms D, Dual On, Dual Off, and Forms to check LPRINTs on the CRT.

Wright's Electric
405 East Bates St.
Hebron, IN 46341

Safe Landing

I have made changes to my article "Jet Bomber" (*80 Micro*, May 1983, p. 298). One reader was frustrated because the plane crashes when it flies too close to the mountain top. The changes in

```
10 INPUT"DO YOU WISH TO OUTPUT TO VIDEO OR PRINTER (V OR
P)";Q$
20 IF Q$="P" THEN 50
30 POKE 16422,08:POKE 16423,4
40 GOTO 60
50 POKE 16422,0:POKE 16423,255
60 LPRINT
```

Program Listing 3. This lets you output programs with LPRINT statements to the CRT or printer for a 48K Model I.

```
10 INPUT"DO YOU WISH TO OUTPUT TO VIDEO OR PRINTER (V OR
P)";Q$
20 IF Q$="P" THEN 50
30 POKE 16421,7:POKE 16422,115:POKE 16423,4
40 GO TO 60
50 POKE 16421,6:POKE 16422,194:POKE 16423,3
60 LPRINT
```

Program Listing 4. This lets you output programs with LPRINT statements to the CRT or printer for a 16K cassette-based Model III.

NEW CLOCK-80

THE RIGHT TIME AT THE RIGHT PRICE

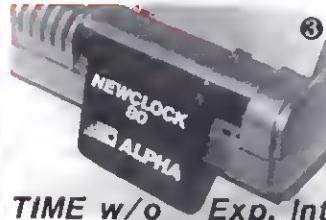
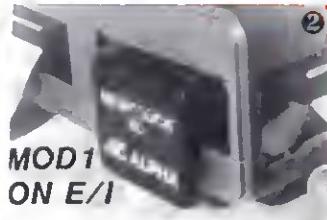
MODEL I



MODEL III



\$59.95



Wouldn't it be nice if your computer could always boot up with the right time and date and then stay accurate. Newclock-80 will enhance your Model I or III system with powerful clock/calendar/timer functions.

Using LSI (large scale integration) and custom circuits, Newclock-80 provides MO/DATE/YR, HR:MN:SEC plus AM/PM and day of week and even takes care of leap years! It continues to keep time and date with quartz accuracy when the computer is turned off or experiences a power failure. A single battery lasts over 2 years.

Compatibility: Newclock-80 is compatible with any operating system, including DOSPLUS, NEWDOS, LDOS. With its fully decoded circuitry it will work with any other hardware you may own. Bus expanders are available.

Installation is very simple, no tools, no disassembly, no soldering. Just plug it in, that's all. There is no power supply or messy cable. Newclock-80 plugs into the rear of the keyboard **③** or side of the Exp. Int. **②**. Model III Newclock fits the 50 pin card edge (underneath) **①**.

The Software: Newclock-80 is as easy to use as it is to install. -"SET", a Basic program, is used only once to set the time and date and select 12 or 24 hour format. -"TIMESTR", also in Basic, patches your computer "TIME\$" function to read Newclock-80. It also adds "TIME\$" to keyboard-only systems, a short routine is simply "poked" into low memory.

Newclock-80 uses 12 ports (176 to 188): 6 for the time, 6 for the date. The data is conveniently stored in decimal form, no conversion is needed. You can read or modify any digit using simple Basic "INP" and "OUT" statements.

No risk trial. Order your Newclock-80 today, see how easy it is to install and operate then decide within 30 days if you want to keep it. If for any reason you are not delighted with its quality and performance, you may return it for a prompt and courteous refund.

Your unit will come complete **④** with software on tape, detailed instructions, handy reference card, and a 90 day warranty. Specify Model I or III. Software is also available on disk: add \$5. Lithium battery (not included) available from RADIO-SHACK (#23-162) or add \$1.50 to your order.

Thanks to outstanding engineering and efficient manufacturing, ALPHA Products is once again able to offer a great product at a surprising price. Order your Newclock-80 at no obligation today.

Toll Free Order Line
800-221-0916

Orders Only, NY & Info call (212) 296-5916. Hours: 9-5 E.S.T.

ADD \$2.50 PER ORDER FOR SHIPPING AND HANDLING.
WE ACCEPT VISA, MASTERCARD, CHECKS, M.O.
C.O.D. ADD \$3.00 EXTRA.
NY RESIDENTS ADD SALES TAX.
OVERSEAS, FPO, APO: ADD 10%.
DEALER DISCOUNTS AVAILABLE.



ALPHA Products

79-04 Jamaica Ave., Woodhaven, NY 11421 ✓ 17

(212) 296-5916



INPUT

```
325 PO=15700:PC=32
470 PP=P1-A*64:POKE PO,PC:PC=PEEK(PP):IF PC<>32 AND (PC AND
15) T8EN GOSUB 570:FOR X=1 TO 300:NEXT:GOTO 640 ELSE POKE
PP, 94:PO=PP-1:RETURN
```

Program Listing 5. Allows lower bombing runs for Jet Bomber.

Program Listing 5 allow lower bombing runs.

The odd logical expression is not a typographical error; rather, it's bit manipulation via Basic.

*Thomas H. Rogers, Jr.
10820 E. Maxwell
Spokane, WA 99206*

"Paintbrush" Graphics

Several MX-80 owners with Graftrax Plus have written me concerning problems with the listings in my article "The Printer as a Paintbrush" (*80 Micro*, May 1983, p. 218 and June 1983, p. 282).

When I wrote the article, Graftrax Plus was not yet available. The listings published are correct for Graftrax 80, but Graftrax Plus owners need to use 4 bytes to initialize each printer's graphics mode.

The first 2 bytes must be CHR\$(27) and either K or L, depending on whether you want the 480 or 960 mode. The next 2 bytes tell the MX-80 how many graphics bytes the program will send. It is the second of these 2 "count" bytes that causes problems.

With Graftrax 80, that second byte is treated as a zero if it is 255. This is handy for Model I since it can't LPRINT a zero byte. However, Graftrax Plus interprets the byte in modulo 8 arithmetic. Hence, Graftrax Plus perceives a 255 byte as a 7.

This error occurs several times in those listings; line 70 of Program Listing 1b (May 1983, p. 219) is an example. Change CHR\$(255) to CHR\$(8) for the line to run with Graftrax Plus. In modulo 8 arithmetic, this line is interpreted as zero so the program works. Graftrax Plus owners should make this change in each listing wherever they initialize the printer for graphics.

*Mike Keller
13423 Desert Hills NE
Albuquerque, NM 87111*

Copy-Wrong

I'm writing to express my dismay

over the direction your editorials have taken lately. You recently accepted ads from WittSoft for a product made to copy another company's copyrighted software. This program is in the same class as burglar tools. They are even using a name that we have been using since last November for our ham radio program.

I could go along with accepting their ad, but writing a review of the product is going too far. In the review you sound like you are condoning the use of this product. Do you realize that sales of Model III programs have decreased measurably since last November? This is due to the number of downloads and clubs where people make illegal copies of software.

I went to a computer show in San Francisco and everyone that stopped by our booth told us how much they enjoy Cyborg. It's interesting that you can sell 10 copies of a program in a city and 100 people tell you how much they like it.

Many firms have stopped making TRS-80 software, including Big Five, Med Systems, and Soft Sector Marketing. Others, like Adventure International, are slowing down production of TRS-80 software. Why? Because there isn't a good return for the amount of work necessary to make a good program.

By promoting this product you are actually encouraging Kim Watt, probably the best software author writing for the TRS-80, to start writing for some other computer, like the IBM Personal Computer.

My two favorite authors have stopped writing software for the Model I/III. PowerSoft is writing SuperUtility for the IBM. You seem to be helping to ensure that only mediocre software is produced for the TRS-80.

Radio Shack has promoted good software at a fair price. What other system has its manufacturer selling a word processor or an excellent data base for around \$100? TRS-80 owners have come to expect free software, and with this attitude they're hurting themselves.

Computer Shack has some excellent products. At last count we had 20 different software packages—this could be the largest of any company publishing TRS-80 software. We take out three to five pages of advertising in every issue of *80 Micro*, and so far you have reviewed one of our products.

*Gordon Monnier
Computer Shack
Pontiac, MI 48054*

Many people would like us to pass judgement in the name of our readers on various types of software. But that is not our role. We exist as an information source, and we will not censor any material because someone has a vested interest in seeing that material censored.

We deemed that WittSoft's program, Super Duper, would interest a large number of our readers. Publishing a review of the program in no way implies that we endorse pirating Super Utility Plus, any more than publishing a liquor ad would mean that we condone drunk driving.

We remain strongly opposed to software piracy. But editorial censorship would be the easy way out. It would create a fantasy that piracy no longer existed, and would do nothing to stop it.

Finally, any software company that abandons the TRS-80 because of piracy is deluding itself if it thinks that life is easier anywhere else. Piracy is not restricted to the TRS-80, but is an industry-wide problem.—Eds.

Column Changes

I typed Program Listing 3 of the MiniCalc program by John Corbani, (*80 Micro*, May 1983, p. 140). His program is great, but I could only get five columns across a page. My changes eliminate the extra alpha column headings.

Line 470 contains the code to set an Epson printer to 132 characters per inch, and the reference to number of columns in line 110 is changed from 14 to 15. Line 475 sets unidirectional printing and checks for number of columns.

If there are eight or fewer columns, set Q to 1 and drop to line 480. If there are more than eight, set Q to 9 and go to line 476 to print the first eight columns. Then go to line 480 to print the rest. Line 490 keeps the underline length correct.

With these changes you can print the

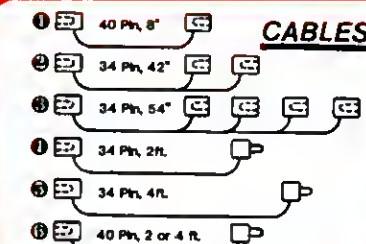
NOW MODEL I AND MODEL III!

Now Model III users can take advantage of the ALPHA I/O system too. Our new MOD III/I BUS CONVERTER allows most port based Model I accessories (such as our ANALOG-80, INTERFACER-2 and INTERFACER-80) to connect to the Model III bus. MOD III/I BUS CONVERTER, complete with all connectors, only \$39.95.



PRINTSWITCH

Have 2 printers on line at all times and select printer 1 or 2 by means of a conveniently located switch. End the problem of constantly plugging and unplugging printer cables. PRINTSWITCH is a compact module that plugs onto the parallel printer port of your TRS-80 and provides an edge connector for each of your two printers. It works with any two types of printers dot matrix, daisy wheel, plotters, TRS-80 converted electrics, etc. Assembled, tested, ready to use with connector and instructions. For Model I or III (please specify) ONLY \$59.00



X5 X4 X3 X2

SUPERIOR QUALITY REPLACEMENT & EXTENSION CABLES

Highest quality cable and high force gold plated contacts ensure the utmost in connection reliability

① KEYBOARD TO EXPANSION INTERFACE	\$21
② DISK DRIVE CABLE FOR 1 OR 2 DRIVES	\$32
③ DISK DRIVE CABLE FOR 3 OR 4 DRIVES	\$45
④ DISK DRIVE CABLE EXTENDER	\$22
⑤ PRINTER CABLE EXTENDER	\$24
⑥ 40 PIN BUS EXTENDER - 2 ft	\$22
4 ft	\$24

Custom cable configurations are also available. Call us

YOU ASKED FOR IT: EXPANDABUS™ X1 X2 X3 AND X4
CONNECT ALL YOUR TRS 80 DEVICES SIMULTANEOUSLY
on the 40 pin TRS-80 bus. Any device that normally plugs into the keyboard edge connector will also plug into the EXPANDABUS. The X4 is shown with protective covers (included). The TRS-80 keyboard contains the bus drivers (74LS367) for up to 20 devices more than you will ever need. Using the E/I it plugs either between KB and E/I or in the Screen Printer port. Professional quality gold plated contacts. Computer grade 40 conductor ribbon cable.
X2 \$29 X3 \$44 X4 \$59 X5 \$74
Custom configurations are also available. Call us



ANALOG-80 A WORLD OF NEW APPLICATIONS POSSIBLE

8 DIGITAL MULTIMETERS PLUGGED INTO YOUR TRS-80™ Measure Temperature, Voltage, Current, Light, Pressure, etc. very easy to use. For example, let's read input channel #4. LD OUT 0.4 Selects input #4 and also starts the conversion 20 A = 10 Pi(0). Puts the result in variable A. Voila! Specifications: Input range 0-5V to 0.500V. Each channel can be set to a different scale. Resolution 20mV (on 5V range) Accuracy 8 bits (± 5%) Port Address Jumper selectable. Plugs into keyboard bus or E/I (screen printer port). Assembled and tested. 90 day warranty. Complete with power supply, connector, manual. \$139



TIMEDATE 80 REAL-TIME CLOCK/CALENDAR MODULE

Keeps quartz accurate time for 3 years on 2 replaceable AAA batteries (not included). Gives MD-DATE, HR, DAY of WEEK, HR MIN SEC and AM PM. Features INTELLIGENT CALENDAR and even provides for Leap Year. This compact module simply plugs into rear of keyboard or side of Expansion Interface (may be slipped inside E/I). Includes cassette software for setting clock and patching to any DOS including NEWDOS 80 2.0. Optional Y connector allows for further expansion. For Model I. Fully assembled and tested. Complete with instructions and cassette. ONLY \$99.00 + option add \$12.00

GREEN SCREEN WARNING

IBM and all the biggies are using green screen monitors. Its advantages are now widely advertised. We feel that every TRS-80 user should enjoy the benefits it provides. But **WARNING**, all Green Screens are not created equal. Here is what we found:

- Several are just a flat piece of standard colored Lucite. The green tint was not made for this purpose and is judged by many to be too dark. Increasing the brightness control will result in a fuzzy display.

- Some are simply a piece of thin plastic film taped onto a cardboard frame. The color is satisfactory but the wobbly film gives it a poor appearance.

- One optical filter is in fact plain acrylic sheeting.

- False claim. A few pretend to "reduce glare". In fact their flat and shiny surfaces (both film and Lucite type) ADD their own reflections to the screen.

- A few laugh. One claims to "reduce screen contrast". Sorry gentleman but it's just the opposite. One of the Green Screen's major benefits is to increase the contrast between the text and the background.

- Drawbacks: Most are using adhesive strips to fasten their screen to the monitor. This method makes it awkward to remove for necessary periodical cleaning. All except ours are flat. Light pens will not work reliably because of the big gap between the screen and the tube.

Many companies have been manufacturing video filters for years. We are not the first (some think they are) but we have done our homework and we think we manufacture the best Green Screen. Here is why:

- fit right onto the picture tube like a skin because it is the only CURVED screen MOLDED exactly to the picture tube curvature. It is cut precisely to cover the exposed area of the picture tube. The fit is such that the static electricity is sufficient to keep it in place. We also include some invisible reusable tape for a more secure fastening.

- The filter material that we use is just right, not too dark nor too light. The result is a really eye pleasing display.

We are so sure that you will never take your Green Screen off that we offer an unconditional money back guarantee. Try our Green Screen for 14 days. If for any reason you are not delighted with it, return it for a prompt refund.

A last word: We think that companies like ours who are selling mainly by mail should list their street address, have a phone number for questions and orders, accept CODs, not every one likes to send checks to a P.O. box, offer the convenience of charging their purchase to major credit cards. How come we are the only green screen people doing it? Order your ALPHA GREEN SCREEN today. \$12.50



\$8.95



DISK DRIVE EXTENDER CABLE, FREE YOUR MINI-DRIVES.

End the daisy-chain mess once and for all. Fits all mini-drives: Percom, Aerocomp, Shugart, Micropolis, MTI, Vista, Perlec, Siemens, BASF. Easy to install: just remove the drive cover, plug in the EXTENDER CABLE and replace the cover.

Now you can change and move your drives without disassembly. Keep the cover on and the dust out. High reliability gold plated contacts, computer grade 34 conductor cable. Tested and guaranteed.

Get one for each drive ONLY \$8.95

INTERFACER-80 the most powerful Sense/Control module
• 8 industrial grade relays single pole double throw isolated contacts 2 Amp @ 125 Volts. TTL latched outputs are also accessible to drive external solid state relays.
• 8 convenient LEDs constantly display the relay states.
• Simple OUT commands (in basic) control the 8 relays.
• 8 optically-isolated inputs for easy direct interfacing to external switches, photocells, keypads, sensors, etc.
• Simple INP commands read the status of the 8 inputs. Selectable port address. Clean, compact enclosed design. Assembled, tested. 90 days warranty. Price includes power supply cable, connector, superuser's manual. \$159



ALPHA Products

79-04 Jamaica Ave., Woodhaven, N.Y. 11421

Info and order: (212) 296-5916

✓ 17

ADD \$2.50 PER ORDER FOR SHIPPING AND HANDLING
ALL ORDERS SHIPPED FIRST CLASS MAIL.
WE ACCEPT VISA, MASTER CHARGE CHECKS, M.D.
COD ADD \$2.00 EXTRA
QUANTITY DISCOUNTS AVAILABLE
N.Y. RESIDENTS ADD SALES TAX



full 16 columns by 26 rows on one sheet of standard-sized paper.

*Howard Potvin
2527 Los Padres Drive
Rowland Heights, CA 91748*

Design or Detail?

When I read the June cover, "Software Construction: How to Build a Better Program," I expected to find articles dealing with overall program design and structure. Instead I found articles whose emphasis was on low-level detail. I think your readers need to learn more about proper program design, not tricks and shortcuts. I'm afraid that by stressing these tricks, our new generation of programmers will be no better off than the pioneers of the 1950s.

The solution lies in weaning these people from Basic and Assembly languages; if any languages encourage bad programming practices, it is these two. I feel that no one should stay with Basic for more than a month. Give them that month and then force them on to higher-level languages. Advanced Basic programming is a myth. You should encourage articles with well-designed and well-implemented programs written in C, Pascal, Fortran, or Modula-2.

*Edward D. Pirroni
1619 Coach Drive
Grand Rapids, MI 49501*

ERROR Trap

John Ratzlaff's Prometheus 5 Hard Disk System review (*80 Micro*, August 1983, p. 50) states that DOSPLUS 4.0 is included with the system at no extra charge. Since the review appeared, Computex has changed its policy. DOSPLUS 4.0 is no longer included with the system, but Prometheus 5's price has dropped from \$1,495 to \$1,295.

In *80 Micro*'s Buyer's Guide to CoCo Utilities (July 1983, p. 212) the address for A. M. Hearn Software was inadvertently omitted. It is 602 South 48th St., Philadelphia, PA 19143.

Micro-Design

Micro-Design offers a floppy disk system for the Model 1. It is a plug-compatible, 40-track, 5 1/4-inch disk drive. Its average access time (track-to-track and data-transfer rates) are the same as those listed by other manufacturers. These figures are derived by the manufacturer of the drive mechanism and change little from drive to drive.

For the Model 111 computer, Micro-Design offers three floppy disk systems:

the MDX-6A, MDX-6B, and MDX-6C. All three include the MDX-6 floppy disk controller that handles both 5 1/4- and 8-inch disk drives. They also include all hardware and cabling required for the internally mounted disk drives.

The difference between these systems lies in the disk drives supplied. The MDX-6A offers 40-track, single-sided, double-density 5 1/4-inch drives with a storage capacity of 250K. The first drive MDX-6A upgrade costs \$399, and the second internal drive \$189.95.

The MDX-6B upgrade offers 40-track, double-sided disk drives with a capacity of 500K. The first drive upgrade costs \$474, and the second \$274.

The MDX-6C upgrade system lets you add four internal slim-line disk drives. These 40-track, 5 1/4-inch, double-sided drives offer 500K of memory. Special added features ensure reliable, trouble-free operation. The first MDX-6C upgrade costs \$495, additional drives cost \$295. A total system offers the user 2 megabytes of unformatted, internally-mounted storage.

Micro-Design offers a one-year warranty, and a 24-hour repair or replace policy on all upgrades. All of these upgrades are compatible with the new Model 4, as well.

Michael B. Shapiro

Micro-Design

*6301 Manchaca Road, Suite J
Austin, TX 78745*

ALWAYS AT
SALE PRICES

TRS-80®

ALWAYS AT
SALE PRICES

OUR TRS-80s Have the Radio Shack warranty



To get YOUR SALE price CALL:
1-800-433-SALE

• RADIO SHACK



**WE SHIP
FAST!**

DFW COMPUTER CENTER
326 MAIN ST., GRAPEVINE
TEXAS 76051 — (817) 481-7283



The Answer is...

NEWSRIPT!™

THE WORD PROCESSOR FOR BUSINESSMEN AND PROFESSIONALS

With ongoing support directly
from us

A FEW OF NEWSRIPT's 200 STANDARD FEATURES:

- FDRM LETTERS WITH MERGING OF NAMES AND ADDRESSES
- GIVES SUPERB APPEARANCE TO YOUR FINAL DOCUMENTS
- COMPREHENSIVE MANUAL WITH TUTORIAL AND EXAMPLES
- CENTERING, TOP/BOTTOM TITLES, INDENTS, PAGINATION
- UNDERLINING, BOLDFACE, DOUBLE-WIDTH, ITALICS*
- SUB/SUPER SCRIPTS, RIGHT-JUSTIFIED PROPORTIONAL†
- CREATES TABLE OF CONTENTS, SORTED INDEX
- "LEGAL" LINE NUMBERING
- SCREEN GRAPHICS, SPECIAL PRINTER SYMBOLS*
- SEARCH REPLACE GLOBALLY OR WITHIN LINES, COLUMNS
- BLOCK MOVE, COPY, DELETE, INSERT, FILE MERGES
- AUTOSAVE, WHOOPS, DIRECTORY, KILL
- SUPPORT FOR ALL LISTED PRINTERS IS INCLUDED **
(NO PATCHES INVOLVED) **
- SUPPLIED READY-TO-RUN ON "TINY" DOSPLUS
- ALSO RUNS UNDER NEWDOS 80, LDOS, MULTIDOS, TRSDOS

NEWSRIPT 7.1:	\$124.95
Mailing Labels Option:	29.95
Special: NEWSRIPT + LABELS:	139.95
Daisywheel Proportional Option:	49.95
"Pencil"/"Scripsit" File Convertor:	24.95
NEWSRIPT Manual & Reference card only:	29.95
Electric Webster + Correction Feature:	149.50
Hyphenation Feature for Electric Webster:	49.95
Grammatical Feature for Electric Webster:	39.95
Dotwriter 3.0:	79.95
Dotwriter + Letter Utilities:	99.95
6.0 PLUS-MSS Model 4 utility pak	49.95

REQUIRED CONFIGURATION:

48K TRS-80, MAX-80, LNW, or compatible, with one or more disk drives. Specify Model I or Model III.

* some features work only if your printer has the mechanical capability.

** Daisy Wheel Proportional is an extra-cost option.

**TO ORDER, CALL NOW,
TOLL-FREE: (800)**

824-7888, Operator 422

For orders, information, or names of nearby dealers:
(213) 764-3131, or write to us.

Order from your Software dealer or from:

PROSOFT®

Dep't. C, Box 560 No. Hollywood, CA 91603

TERMS: VISA, Mastercard, checks, money orders, COD. No P.O.'s accepted. Most orders shipped within 24 hours. Please add \$3.00 for surface UPS in U.S.A., or \$6.00 for UPS Blue Label. Add \$6.00 in Canada, \$15.00 overseas air shipment, 6 1/2% sales tax in California.

BUILT-IN SUPPORT FOR MOST POPULAR PRINTERS; INCLUDING:

Anadex, Brother, Centronics, C.Itoh, Diablo, Epson, Gemini, Microline, NEC, Prowriter, Qume, Radio Shack (LP 1-8, DW2, DMP-410, DWP 200-2100), Smith Corona, Teletype, Typewriter, anything compatible with any of these, and many others, parallel and RS-232.

SPECIAL AVAILABLE OPTION: Right-justified proportional for Diablo, F-10, Qume, Spinwriter, etc. Requires "Daisywheel Proportional" Option plus NEWSRIPT.

REVIEWERS AND USERS AGREE:

"NEWSRIPT" is the best word processor I have seen . . . unsurpassed in printer control . . . no other TRS-80 word processor can match its ability to format text . . . its editor is fast, easy, and powerful." (80 MICRO, Oct. 1982)

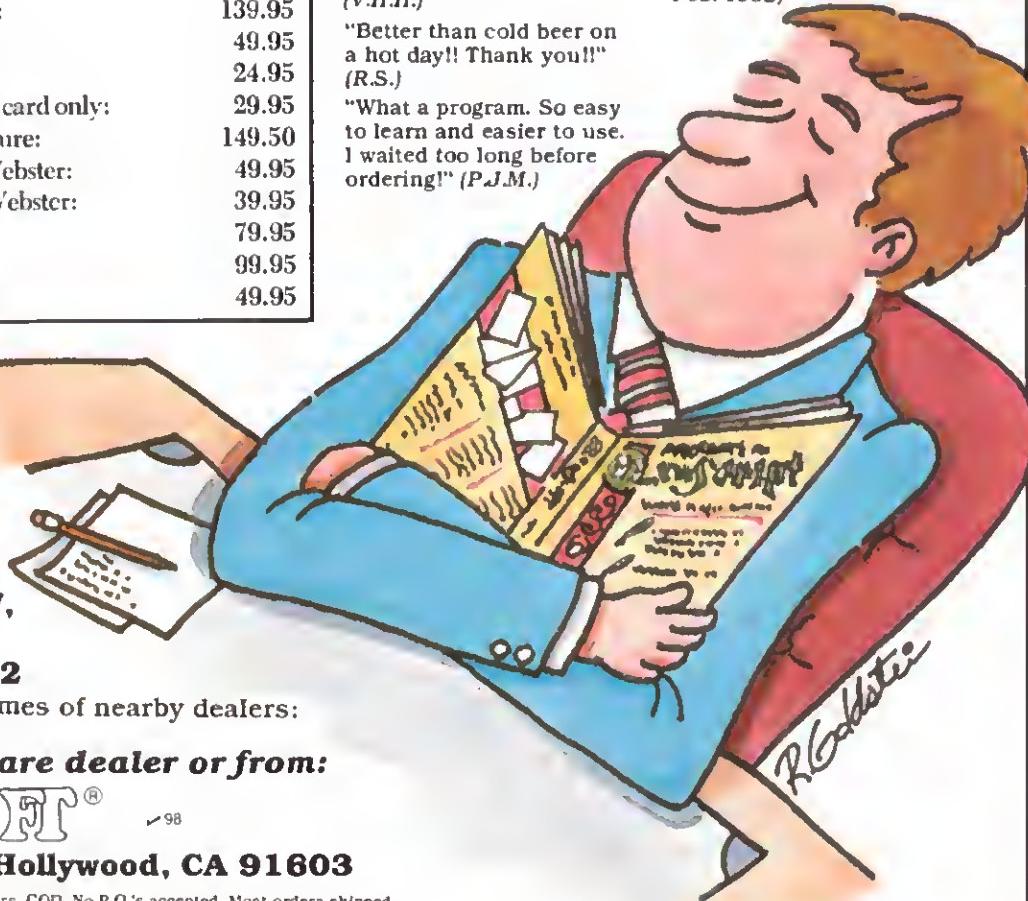
"Your phone information system and the prompt and courteous staff that you provide to help your clients . . . are worth the cost of the system." (V.H.H.)

"Better than cold beer on a hot day!! Thank you!!" (R.S.)

"What a program. So easy to learn and easier to use. I waited too long before ordering!" (P.J.M.)

. . . takes the TRS-80 to a new level of text handling . . . very user-friendly . . . superb documentation, adaptability to many printers and operating systems . . . a standard against which other TRS-80 word processing programs will be judged." (SOFTSIDE, Dec. 1982)

. . . ongoing support second to none, with superb documentation." (80 U.S. Journal, Feb. 1982)



Is Archbold Missing?

I'm told that there was a speed-up kit offered by Exatron for the Model I that no longer is available, but that there's a similar kit called "Archbold Speed-up Kit" that does the same thing. The problem is that I've been unable to locate a source for the Archbold. Can someone help me?

M.S. Yellin
1877 Morgan Ave.
Claremont, CA 91711

Ad-Ware Anyone?

I'm looking for advertising software for my Model III. Does anyone know where I can buy such software?

Nick Lambesis
4531 North 16th St.
Phoenix, AZ 85016

I Need a Patch

Can anyone tell me where I can obtain a patch program for lowercase characters that works with the Model I Electric Pencil cassette version?

George Sanquenetti
1439 South 3rd St.
Clinton, IN 47842

Model III Utility Needed

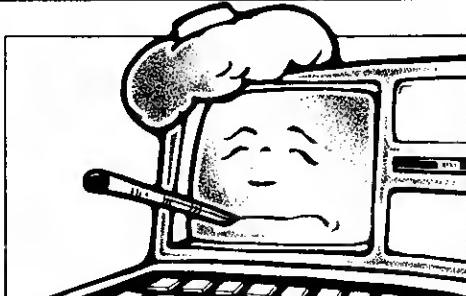
I need a utility for my Model III that lists the variables used in a program in one column and the line numbers as they appear in another. Can someone help me?

Richard Compton
1635 Oramas Road
Santa Barbara, CA 93103

Program to Print

I'm looking for a Model III program to print graphics (lettering, sketches, designs, and so forth) on an IDS 440G printer. Can someone advise me?

Jan Lanoue
125 Irving St.
P.O. Box 2154
Framingham, MA 01701



Looking for answers

Do You Know?

Does anyone know how to embed hexadecimal code in Color Scripsit? One of our customers wants to receive ASCII text files via modem and typeset them without using the keyboard.

So far we have been unable to find any information on this accomplishment for the Color Computer.

Harley L. Smith
Athol Daily News
225 Exchange St:
Athol, MA 01331

Stumped with Pascal

I'm a reasonably capable Basic Programmer, but Pascal has me stumped. Is there a magazine, newsletter, or book for Alcor Pascal beginners?

Also, does anyone have source code programs that they would like to swap?

Robert Athanasiou, M.D.
13 Lawnridge Ave.
Albany, NY 12208

Losing Control

Can someone supply a patch that will allow me to change the Scripsit control key?

E.J. Jennings
299 Ridgewood Ave.
Glen Ridge, NJ 07028

Expecting Too Much?

Our library is looking for a printer that is compatible with both the Model III and the Apple II Plus, that can handle card stock for library catalog cards, that prints in condensed format with extended lowercase letters, that is able to cut stencils, and that is capable of reversing to make second columns. Can someone help us?

Diane D. Kester
Eastern Wayne Junior High
Route 10, Box 28
Goldsboro, NC 27530

How?

How is it possible to reduce both amplitude and frequency through the cassette port? Also, what happened to EDF, and how can I acquire a copy of this program? If anyone has a copy of EDF I'm willing to pay photocopying and mailing costs for it.

Rick Sayre
4922 Cozad Way
Stockton, CA 95212

Back to School

Can someone tell me where I can get information on classes on the west coast for the TRS-80? I'm looking for a course that's two weeks long and that has hands-on use of the TRS-80 with instruction involving compatible software packages.

Craig Horton
2352 Delta Waters Road
Medford, OR 97501

Lend a Hand!

I have a Model I with a version G board. The level II ROMs are on a separate board and recently became disconnected from the ribbon cable. I need a diagram that shows what line goes to what hole on the circuit board. Can someone lend a helping hand?

John Coleman
811 Piedmont Ave.
Atlanta, GA 30308

From Computer Plus to YOU...

PLUS after PLUS after PLUS

Model 100
Model 100 8K \$679
Model 100 24K \$835

Color Computer 16K \$175
w/16K Ext. Basic \$255
w/32K Ext. Basic \$345

Model IV 16K \$849
Model IV 64K
2 Disk & RS232 c \$1699

Okidata 82A \$399
Okidata 92 \$510

Color Computer Disk Drive
Drive 0 \$329 Drive 1 \$235

Smith Corona TPI
Daisy Wheel \$495

BUY DIRECT Here are just a few of our fine offers...
call TOLL FREE for full information.

COMPUTERS

Model 12 64K 1 Drive	\$2699
Model 12 64K 2 Drive	3375
Model IV 16K	849
Model IV 64K 2 Disk & RS232 c	1699
Color Computer 16K	175
Color Computer 16K w/extended basic	255
Color Computer 32K w/extended basic	345
Pocket Computer 2	165
Model 16 1DR 128K	4199
Model 16 2DR 128K	4799
Model 100 8K	679
Model 100 24K	835
MODEMS	
Lynx Direct Connect MI/MII	235
Hayes Smart Modem II	235
Hayes Smart Modem 1200	565
Novation Smartcat 1200	459
Novation J-CAT	125
R.S. Acoustic Coupler AC-3	129
R.S. Modem I D.C.	129

R.S. Modem II D.C.

199

R.S. DC-1200

565

R.S. Modem II D.C.	199	R.S. Model IV 1ST-Drive	515
Tandon 40 Track	289	Color Computer Drive 0	329
Color Computer Drive 1	235	Color Computer Drive 1	235
Primary Hard Disk MII	3099	Primary Hard Disk MIII	2199

DWP-410

1320

Silver Reed EXP 550 D.W.

665

Smith Corona TPI Daisy Wheel

495

Epson

199

CGP-115

315

DMP-100

410

DMP-120

599

DMP-200

1010

DMP-400

1539

DMP-500

1779

DMP-2100

399

Okidata 82A

655

Okidata 83A

999

Okidata 84 Parallel

510

Okidata 92

859

Okidata 93

319

Gemini 10X

375

Prowriter

DISK DRIVES

R.S. Model IV 1ST-Drive

515

Tandon 40 Track

289

Color Computer Drive 0

329

Color Computer Drive 1

235

Primary Hard Disk MII

3099

Primary Hard Disk MIII

2199

ETC.

CCR-81 recorder

52

C. C. Joysticks (pair)

22

16K RAM Chips

25

64K RAM Chips

75

8K PAR/PAR Micrafaser

149

Parallel Printer Cables are

available for most computers.

SOFTWARE

Brand Name Software •

Send for listing.

R.S. Software 10% off list

Coco FHL Flex D.O.S.

69.95

Color Computer 64K requires

Disk 0 and D.O.S.

We have the lowest possible
Fully Warranted Prices AND
a full complement of Radio Shack
Software.

Prices subject to change without notice.
Not responsible for typographical errors.
TRS-80 is a registered trademark of Tandy Corp.



TOLL FREE
1-800-343-8124

computer
plus

P.O. Box 1094
480 King Street
Littleton, MA 01460
617-486-3193

Write for your
free catalog

✓ 18

Another Line

A line is missing in Program Listing 6 of Mare-Anne Jarvela's Model 100 article, "The Final Notice" (July 1983, p. 176). Insert the following line to make the program work: 60 H=0:F=0:C=0:T=0:RESTORE.—Eds.

Division Problems

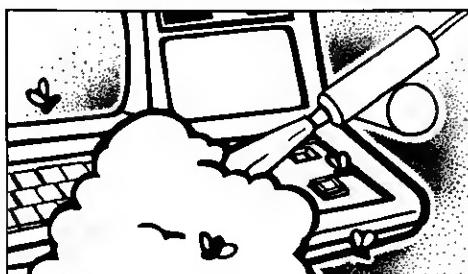
Several lines need to be added to Adam Wells' program listing for "Math Countdown" (February 1983, p. 160). In order to divide, you need to add the following lines:

```
256 GOSUB 270:INPUT "Now, what would
you like to practice";Q:O
N Q GOSUB 285,510,580,645,690
645 CLS
646 PRINT@10*64+30,SH$
647 FORI=1TO10
648 PRINT@64*I2+15,11-I
690 PRINT CHR$(28):END
```

—Eds.

"...diode CR2"?

We inadvertently left out part of the text to Richard Esposito's "40K Color Basic" article (May 1983, p. 212). The first sentence on p. 214 should read "You could install a switch in line with diode CR2." Sorry about that.—Eds.



A Traveling Error

Beve Woodbury's Model 100 article, "Traveling Expenses" (July 1983, p. 171), contained several errors. The program listing to set up the travel expense file was omitted. It should read as follows:

```
10 OPEN"RAM:EXPFL.DO"
FOROUTPUTAS1
20 PRINT#1,"0"
30 CLOSE:END
```

You also have to make several changes to Program Listing 3. First, add line 190:

190 :F=0

Next, change line 420 to:

```
420 PRINT#2,Z;";";N;";";C;";";Y;";";X:
GOTO30
```

Finally, remove the semicolon after in-

put lines 260, 280, 300, 320, 350, 370, and 390. We apologize for these errors.—Eds.

Don't Be Teed-Off!

I had trouble getting Michael Parks' "Tee-Off" program to run correctly (April 1983, p. 108). The program listing gets in trouble in a few places where it should be using single-precision arithmetic instead of integer arithmetic. To fix this problem, remove the DEFINT A-Z from line 10. Also, in Victor Albino's "Billy and the Electric Troll" (May 1983, p. 320), the second graphic in line 160 should be changed to read CHR\$(177).

William Eccles
5939 East Quartz Mountain Road
Scottsdale, AZ 85253

A Debug on Debug

The weather forecast program written by Anthony Perri (Feedback Loop, January 1983, p. 400) is correct as originally published and should not be changed as per the May 1983 Debug letter from Rea Plowman (p. 26). For information from the author on how to correctly use this program, see this month's Feedback Loop.—Eds.

THOR symbol of new power for your Model I/III/4 Computer

CALL 1-800-641-3885 for orders only. For technical information or in Colorado call: 303-337-5909.

THOR INTERNAL MODEL III/4

DISK DRIVES

All the hardware and easy directions to install one or two drives—with TRSDOS*—(NEWDOS* for dual drives)

Kit containing one two drives

Single 40	\$449	\$ 649
Dual 40	\$599	\$ 875
Dual 80	\$725	\$1125

THOR WINCHESTER

DISK SYSTEM

SPECIAL PRICE

One or two drives—Price includes one drive with NEWDOS-80* case and power supply—Slot for second drive

5 Megabyte.....	\$1449
10 Megabyte.....	\$1649
15 Megabyte.....	\$1899
20 Megabyte.....	\$2149



Winchester/Network Unit

WMS Western Micro Systems
• 2760 South Havana, Suite S •
Aurora, Colorado 80014

THOR NETWORK CONTROLLER

Connect up to 254 computers of most any make over as much as 5000 feet of cable—Share 5 to 60 megabytes or more of disk storage—Call for additional information and prices

THOR DIGITAL PORT

14 IN and 15 OUT—Each port a full 8 bits.....	
Connector to attach to Model III/4 bus—	
Complete with cable and case—Requires 5 volts at 150 ma.	
Assembled and tested	
For Model I Only	\$39.95
For Model III/4 Only	\$44.95

THOR POINT-OF-SALE SYSTEM

Includes 16 lines of 32 changes of green screen monitor (adjustable tilt), keyboard, 40 character per line alphanumeric printer, and cash drawer—Software to perform all cash register functions such as automatic pricing, inventory control, and daily totals. Can plug into a Model III/4 or the THOR NETWORK..... \$1799

*TRSDOS is a trademark of Tandy Corp. and NEWDOS-80 is a trademark of Apparat, Inc.
Prices are cash—Visa/MasterCard/American Express/COD available on request

Dealers enquiries welcome

INVENTORY CLEARANCE SALE

SPECIAL BUY ON TWO DRIVE DISK DRIVES



An all new low cost internal half size drive to expand your storage capability. Double headed 40-track kits have double the storage capacity as full size double headed drives and utilize half the space. Disk drives use standard 5-1/4" diskettes. Includes DOS + Operating System. MOD III/MOD IV compatible.

DRIVE 1 KIT PLUS DRIVE 2

BOTH for \$729

SMALLER DRIVES LARGER VALUE

IF PURCHASED AT THE SAME TIME RS232 KIT \$59⁹⁵

CLOSE OUT SPECIALS*

FREE DOS 3.3 WITH CLOSE-OUT PURCHASE

Mod III
48K COMPUTER, W/2 DRIVES

FROM **\$995⁰⁰**

A new low cost internal disk kit is available to expand your storage capability. With this kit, you may expand your 16K TRS-80 Mod III computer. Includes: 1-MTI 40 track, double density disk drive, power supply, controller, cables and DOS PLUS operating system.

\$459

INCLUDES
DOS PLUS
OPERATING
SYSTEM
\$100 VALUE



INTERNAL DISK DRIVE KITS

INVENTORY CLOSEOUTS

DESCRIPTION	\$\$	DESCRIPTION	\$\$
MOD III PROFILE	\$60.00	MT-90 C ITOH PROWRITER	\$400.00
WORDSTAR 3.0 w/MANUAL	\$183.00	MT-80 PRINTER	\$400.00
MAIL MERGE 3.0 w/MANUAL	\$53.75	PERTEC DRIVES MOD I 35 TR.	\$100.00
CALC STAR 3.0 w/MANUAL	\$114.00	WINCHESTER 5Mb HARD DISK	\$950.00
NEWSSCRIPT 7.0	\$88.75	ANADEX DP8000 PRINTER	\$350.00
SPEED UP MOD III KIT	\$48.00	HARD DRIVE LINEAR	
CP/M 48K w 80col	\$210.00	POWER SUPPLY	\$38.50
COLDING/ANTI-GLARE KIT	\$19.95	16K RAM CHIPS	\$2.00
OLIVETTI ET-121 TYPEWRITER	\$800.00	VERBATIM 5-1/2"	
MICROLINE 82 PRINTER w/TRACTOR FEED	\$500.00	DISKETTES (40 TR.)	\$2.69
TOSHIBA DUAL HEAD 1/2 SIZE	\$259.00	40-80 TR. VERBATIM DISKETTES	\$3.30

MTI DOES IT. Our CP/M 64K turns your TRS-80 Model III into two computer systems, with memory upgrade to 64K and an 80" x 24" column video card, you will convert your computer to a CP/M base machine.

LIKE THE BIG BOYS. That means you can access the single largest body of microcomputer software used by companies like Xerox, Osborne, Eagle, etc. What is better, is that you can switch back and forth between TRS-DOS and CP/M modes, and our own Z-80 monitor.

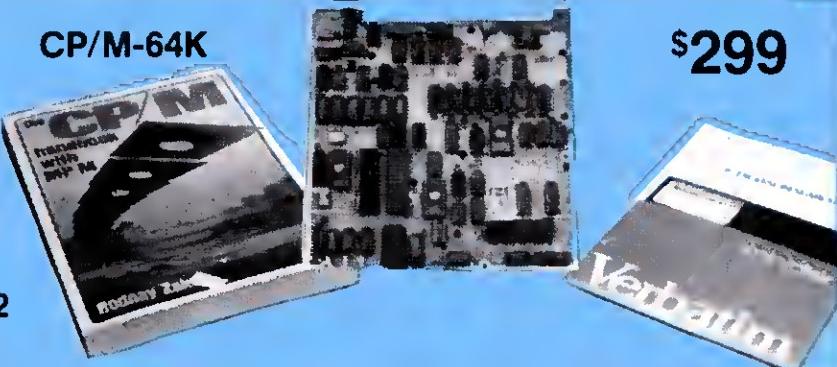
EASY INSTALLATION. The CP/M 64K system plugs directly into the TRS-80 CPU board.

HUNDREDS OF APPLICATIONS. You have available literally hundreds of programs written for many mini and micro computers under CP/M.

Optional CP/M 2.2 Operating System

**CP/M 2.2
\$99**

CP/M-64K



\$299



MICROCOMPUTER TECHNOLOGY INC.
1530 S. SINCLAIR, ANAHEIM, CA 92806
(714) 978-9833
NOTE: WE'VE MOVED TO A LARGER FACILITY

THIS IS A LIMITED TIME OFFER

All items subject to
the quantity on hand
*ITEMS SOLD AS-IS

U.S. PRICES F.O.B. ANAHEIM,
CALIFORNIA AND MAY VARY BY AREA

CP/M is a registered trademark of Digital Research Inc.
TRS-80⁺ is a registered trademark of Tandy Corp.
MTI is a registered trademark of Microcomputer
Technology Inc.

THE NEXT STEP

by Hardin Brothers

TRS-80s have three different kinds of random-access memory (RAM): 1K of keyboard memory, which I discussed last month; 1K of screen memory (between 3C00 and 3FFF hexadecimal (hex)) that holds the value of each screen position; and 4K, 16K, 32K, or 48K of user memory from 4000 hex to the highest accessible address of the system.

User RAM is further subdivided. One section of memory (4000–42E8 hex on the Model I, 4000–43E8 hex on the Model III) is set aside for system use. Filled with pointers, temporary values, and buffers, this area of RAM is generally not available to Basic programmers. However, many specific values in this low memory are invaluable if you can include machine-language routines in your Basic programs.

The first 21 bytes in low memory, 4000–4014 hex, contain seven restart vectors. A restart (or RST) is a special Z80 machine-language instruction that uses 1 byte to force a call to one of eight addresses in page-zero memory. The Z80 RSTs save time and programming space by calling often-used subroutines at addresses 00, 08, 10, 18, 20, 28, 30, and 38 hex.

You can't write too many useful sub-



Using restart vectors

routines in the 8 bytes allowed for each restart; therefore, each restart address contains a jump instruction (JP) to another part of memory. In the TRS-80, all RSTs except RST 00 hex force a jump to a unique, 3-byte instruction near the beginning of low memory. In

low memory, each RST instruction meets another JP command to either an address in ROM or, when a DOS is active, to some address in the RAM used by DOS. (In tape-based systems, RST 28 hex and 30 hex encounter a return instruction; the code for RST 38 hex is different for the Models I and III).

The RST instructions jump from page-zero ROM to low memory RAM, and then back to ROM so the computer can modify or redefine each restart. Most disk operating systems redefine or modify at least some restarts, but some complex machine-language utilities completely redefine the restarts.

How can this information help you? Well, you can use some restarts to simplify your own machine-language routines, and you can modify one to add an extra command to Basic.

Normal Restart Functions

RST 00 hex, as explained above, forces a system reset in the same manner as a JP 0000 hex does. Other than as a short method to end a program, this RST has little use in machine-language programming.

RST 08 hex tests for a match between the byte pointed to by HL and the byte following the RST 08 hex instruction. If the test fails, the routine forces a JP to Basic's Syntax Error routine. Otherwise, HL is incremented to point to the next non-space character, and control returns. RST 08 hex checks necessary syntax, such as closing parentheses, and has some limited value for mixed-language programmers.

RST 10 hex retrieves the next non-space character from the string pointed to by HL. The character is loaded into the A register and the carry flag is set or cleared to show the range of the character. This restart provides an interesting method of adding new commands to Basic (see below).

RST 18 hex compares the value in register pairs DE and HL, and sets the status flags accordingly. Though the routine is simple to write, using RST 18 hex considerably shortens many data-handling programs.

RST 20 hex tests the type (integer, single, double, or string) of the current variable. It sets the status flags and loads a value into the A register to indicate the variable type. The variable

Program Listing 1. Frame routine.

```
00100 ;*****
00110 ;*
00120 ;* FRAME Routine -- defines a new *
00130 ;* Basic command verb, FRAME, which *
00140 ;* creates a border of CHR$(191) *
00150 ;* around the video screen. *
00160 ;*
00170 ;*****
00180 ;
00190 ;
00200 EXIT EQU 1D78H ;SEE TEXT
00210 ;
7000 00220 ORG 7000H ;DOESN'T NEED TO CHANGE
7000 2190FF 00230 LOAD LD HL,FRAME ;HL=> FRAME ROUTINE
7003 220440 00240 LD (4004H),HL ;NEW RST18 VECTOR
7006 C32D40 00250 JP 402DH ;EXIT TO DOS READY
00260 ;
00270 ;NOTE -- On tape systems, change line 250 to jump back
00280 ; to Basic: JP 1A19H
00290 ;
00300 ; -- The next ORG assembles FRAME to the top of 40K RAM.
00310 ; Change to match your system's memory size and
00320 ; requirements.
00330 ;
FF98 00340 ORG 0FF98H ;SEE NOTE ABOVE
FF98 E3 00350 FRAME EX (SP),HL ;SET UP FOR TEST
FF99 7D 00360 LD A,L ;TEST LSB OF CALLING ADDR
FF9A FE5B 00370 CP 5BH ;IS IT RIGHT?
FF9C 2003 00380 JR NZ,NO ;GO IF NOT
FF9E 7C 00390 LD A,H ;NOW TEST MSB
FF9F FE1D 00400 CP 1DH ;IS IT RIGHT?
FFA1 E3 00410 NO EX (SP),HL ;RESTORE STACK & HL
FFA2 C2701D 00420 JP NZ,EXIT ;GO IF WRONG CALL
00430 ;
00440 ;RST 10H was called from 1D5BH -- now test for FRAME
00450 ;
00460 CALL 1D78H ;GET NEXT CHAR. IN A
```

Listing 1 continued

MICRO-DESIGN

If you don't know the number, you should.

1-800-531-5002

THE NEXT STEP

Listing 1 continued

```

FFA8 FE46 00470 CP 'F' ;IS IT AN F?
FFAA 2804 00480 JR Z,YES ;GO IF YES
FFAC 2B NO2 DEC HL ;ELSE FIX POINTER
FFAD C3781D 00500 JP EXIT ;AND GO
00510 ;
00520 ; Current command begins with an 'F' -- Test to see if it
00530 ; is a LET statement.
FFB0 E5 00540 YES PUSH HL ;SAVE HL POINTER
FFB1 CD781D 00550 YES10 CALL 1D78H ;GET NEXT CHAR.
FFB4 FE3A 00560 CP 3AH ;IS CHAR. A ":" ?
FFB6 2808 00570 JR Z,YES20 ;GO IF YES
FFB8 FE00 00580 CP 00H ;IS CHAR. 00H ?
FFBA 2807 00590 JR Z,YES20 ;GO IF YES
FFBC FED5 00590 CP 0D5H ;IS CHAR. A "=" ?
FFBE 20F1 00610 JR NZ,YES10 ;GET NEXT CHAR. IF NOT
FFC0 E1 00620 POP HL ;ELSE RESTORE POINTER
FFC1 18E9 00630 JR NO2 ;AND GO BACK TO BASIC
00640 ;
00650 ; 'F' is not part of a LET statement -- now check syntax
00660 ;
FFC3 E1 00670 YES20 POP HL ;HL=>"F"
FFC4 23 00680 INC HL ;BUMP ONCE
FFC5 CF 00690 RST 08H ;CHECK FOR R
FFC6 52 00700 DEFB 'R'
FFC7 CF 00710 RST 08H ;CHECK FOR A
FFC8 41 00720 DEFB 'A'
FFC9 CF 00730 RST 08H ;CHECK FOR M
FFCA 4D 00740 DEFB 'M'
FFCB CF 00750 RST 08H ;CHECK FOR E
FFCC 45 00760 DEFB 'E'
FFCD E5 00770 PUSH HL ;SAVE POINTER
00780 ;
00790 ;Correct syntax -- FRAME -- has been found
00800 ;
FFCE 21003C 00810 LD HL,3C00H ;HL=> TOP OF SCREEN
FFD1 CDEBF0 00820 CALL HORIZ ;PRINT TOP LINE
FFD4 21C03F 00830 LD HL,3FC0H ;HL=>BEG. OF BOTTOM LINE
FFD7 CDEBF0 00840 CALL HORIZ ;PRINT BOTTOM LINE
FFDA 21003C 00850 LD HL,3C00H ;HL=> TOP OF SCREEN
FFDD CDF4FF 00860 CALL VERT ;PRINT LEFT SIDE
FFE0 213F3C 00870 LD HL,3C3FH ;HL=>TOP RIGHT CORNER
FFE3 CDF4FF 00880 CALL VERT ;PRINT RIGHT SIDE
FFE6 E1 00890 POP HL ;GET ORIGINAL POINTER
FFE7 2B 00890 DEC HL ;CORRECT IT
FFE8 C3781D 00910 JP EXIT ;RETURN TO BASIC
00920 ;
FFEB 3EBF 00930 HORIZ LD A,0BFH ;A=CHR$(191)
FFED 0640 00940 LD B,40H ;B=1 LINE
FFEF 77 00950 HOR10 LD (HL),A ;PUT ON SCREEN
FFP0 23 00960 INC BL ;BUMP POINTER
FFP1 10FC 00970 DJNZ HOR10 ;GO UNTIL DONE
FFP3 C9 00980 RET ;THEN RETURN
00990 ;
FFP4 3EBF 01000 VERT LD A,0BFH ;A=CHR$(191)
FFP6 0610 01010 LD B,10H ;B=# OF LINES
FFP8 114000 01020 LD DE,40H ;DE=LINE OFFSET
FFFB 77 01030 VE10 LD (HL),A ;PUT ON SCREEN
FFFC 19 01040 ADD HL,DE ;HL=> NEXT LINE
FFFD 10FC 01050 DJNZ VE10 ;GO UNTIL DONE
FFPP C9 01060 RET ;THEN RETURN
01070 ;
7000 01080 END LOAD
00000 TOTAL ERRORS

```

Restart	Jump Address	Normal Function
RST 00 hex	(none)	System reset (identical to power on).
RST 08 hex	4000 hex	Compare value pointed to by HL to that immediately following the RST instruction.
RST 10 hex	4003 hex	Examine the next symbol pointed to by HL.
RST 18 hex	4006 hex	Compare DE to HL and set the zero and carry flags accordingly.
RST 20 hex	4009 hex	Test the type of the current variable.
RST 28 hex	400C hex	Reserved for DOS use—normally a DOS function call.
RST 30 hex	400F hex	Reserved for DOS use—normally for invoking Debug.
RST 38 hex	(varies)	Entry point for all maskable interrupts.

Table 1. The Restart patch points.

must have been previously moved to a special buffer in low memory.

RST 28 hex and RST 30 hex are reserved for use by DOS. RST 28 hex is generally used as a DOS request call (for example, a request for a specific DOS overlay). RST 30 hex loads and executes Debug.

RST 38 hex is the system entry point for all maskable interrupts. For one method of changing interrupt processing, see the article I wrote with Jean Durbin, "Computer Security with a Credit Card," *80 Micro*, March 1983, p. 74.

Using the Restarts

As an example of how to use restart vectors, this month's demonstration program defines a new Basic command, Frame, which creates a border of CHR\$(191)s around the video screen. Though not complete (this routine only works in the 64-character display mode and doesn't handle cursor placement), Frame demonstrates how you can write new command verbs.

The Frame routine is shown in Program Listing 1. The definition of Exit in line 200 is critical. The value shown is correct for Models 1 and III tape systems, for all versions of Model 1 TRSDOS and NEWDOS and for all Model III versions of TRSDOS. If you use a different DOS, go to Disk Basic and enter the following command:

```
? PEEK(&H4004); PEEK(&H4005)
```

If 120 and 29 appear, Exit is correct as it is. If different numbers appear, change the value of Exit in line 200 to match the current address in bytes 4004 and 4005 hex.

The key to defining a new Basic command verb is RST 10 hex. Basic starts execution of every statement at 1D5A hex with a RST 10 hex instruction. ROM address 10 hex is the instruction JP 4003 hex. Normally, 4003 hex contains the instruction JP 1D78 hex. Because 4003 hex is in RAM, you can change it to any value you like.

The Load portion of this month's routine (lines 220–250) alters the normal address at 4003 hex so every RST 10 hex instruction results in a jump to Frame. Since Load is only used during initialization, you can place it anywhere in memory. You don't need to protect it.

At line 350, a number of tests begin. First, the address on the top of the stack



Reliable.

You can count on 3M diskettes. Day after day.

Just like the sun, you can rely on 3M diskettes every day. At 3M, reliability is built into every diskette. We've been in the computer media business for over 30 years. And we've never settled in. We're constantly improving and perfecting our product line, from computer tape and data cartridges to floppy disks.

3M diskettes are made at 3M. That way, we have complete control over the entire manufacturing process. And you can have complete confidence in the reliability of every 3M diskette you buy.

Look in the Yellow Pages under Computer Supplies and Parts for the 3M distributor nearest you. In Canada, write 3M Canada, Inc., London, Ontario. If it's worth remembering, it's worth 3M diskettes.



3M

THE NEXT STEP

```
1 ****  
2 **  
3 ** Demonstration program for *  
4 ** FRAME routine -- execute *  
5 ** and protect FRAME before *  
6 ** entering Basic (disk systems) *  
7 ** or before running this program *  
8 **  
9 ****  
10 '  
11 '  
100 CLS  
110 FOR I= 2 TO 13  
120 PRINT @ I*64+I*3, "THIS IS A FRAME-UP";  
130 NEXT I  
140 FRAME  
150 GOTO 150
```

Program Listing 2. Demonstration of Frame routine.

is examined to find the return address after RST 10 hex execution. Numerous ROM, DOS, and Disk Basic routines use RST 10 hex. Let the Frame routine interface only if RST 10 hex is called from 1D5A hex (if the return address is 1D5B hex). If the return address is anything else, all registers except AF are restored, and control is returned to the normal RST 10 hex routine (lines 350-420).

Line 460 calls the ROM routine at 1D78 hex to get the next character in the current Basic line into the A register. Another test checks to see if that character is an F. If it isn't, control returns to Basic to interpret the line normally.

If an F is found at the beginning of the Basic statement, it can either be the first letter of Frame or part of a variable definition (for example, F=10). If it is a variable definition, or LET statement, the variable name is followed by =. Lines 540-630 perform a search for = occurring before the end of the statement. If it isn't found, control drops through to line 670.

The last series of tests starts at line 670. First, the pointer that Basic maintains to keep track of its location in the statement is incremented past the F of Frame. Then, four RST 08 hex instructions test for the correct spelling of Frame. If any test fails, a syntax error is reported and control returns to Basic's normal command level.

If all tests succeed, the HL registers are saved and control finally passes to line 810, where the actual frame around the screen is drawn. Finally, in line 890, the HL pointer is restored and corrected, and control returns to normal Basic operation.

You need to observe several precautions when defining new Basic commands:

- Until your program completes its preliminary tests, preserve all registers except AF. Several routines use RST 10 hex, some of which may expect certain values to be in certain registers.

- Error-trap the new command completely. Every possible syntax error should be accounted for and your program must be able to recover from program errors like syntax and type mismatch.

• The value returned in HL is critical. The normal RST 10 hex routine increments HL before it picks up the next character. Therefore, you should be sure that, when your new command has finished executing, HL points to the last character of the new command. Basic can then determine if the following character is an end-of-line marker (00 hex), a multiple statement separator (:), or something that causes a syntax error. The easiest way to preserve HL is to Push it on the stack when it points past the last character in your command, then Pop and Decrement it before returning to Basic.

Using Frame

Program Listing 2 demonstrates Frame in action. From either DOS READY or by using the System command, execute Frame. Then protect it in high memory (with a disk system, protect it before going to Basic). Finally, enter and run Listing 2.

If you have modified your DOS to include the Restore patch I explained in my June column (p. 24) Frame will not operate. Both routines use the RST 10 hex vector to change Basic. You will have to load Basic, then load Frame into protected high memory, and use Debug to set the correct address in 4004 hex and 4005 hex. Better yet, try Frame with an unmodified version of your DOS.

One final warning: If you write a new verb, make sure it doesn't contain any of Basic's reserved words. If it does, your command is stored in memory partly tokenized. For example, Store would be kept in memory as S T D3H E, because the Basic word Or is tokenized as 0D3 hex. Your computer manual contains a list of reserved words.

Mixing Languages on the Model 4

As soon as I am familiar with the Model 4, I will devote at least a part of a column to discussing which Model III techniques will work with the Model 4, which won't, and why. If any of you have specific suggestions or questions, pass them along and I'll try to answer them as soon as I can. In the meantime, I am looking forward to the excitement of exploring the possibilities and limitations of a new machine. ■

Write to Hardin Brothers at 280 N. Campus Ave., Upland, CA 91786, or contact him through CompuServe. His e-mail address is 72165,735.

ARRANGER

100% Machine Language Disk Index Program for the TRS 80 Model I & III

Automatically recognizes ALL major DOS's!

The Arranger is a master index system that automatically records the names of your programs, what disks those programs are on and type of DOS. Features include:

- Automatic single and double density recognition
- Accepts 1 DOS, DOS+, TRSDOS, DBI DOS, NEWDOS 80, MUI TIDOS
- Works interchangeably with Model III, I double density.
- Capacity of 250 disks, 44 filenames disk
- Quickly locates any amount of free granules
- Finds a program in less than 30 seconds!
- Alphabetizes 1500 filenames in 40 secs.¹
- Option to sort by any extension (BAS, CMD, ???)
- Easily updates diskettes previously added with only 2 keystrokes.
- Backup function built in.
- Uses 1 to 4 drives, 35, 40 or 80 tracks
- Radio Shack Doubler compatible

Requires 32K 1 disk minimum

JUST.....\$29.95

FREE SHIPPING

SATISFACTION GUARANTEED

Specify TRS 80 Model number

(If you've added double density to your Model I, please indicate)

TRIPLE-D SOFTWARE

P.O. Box 642A PERSONAL CHECK
Layton, Utah 84041 VISA OR
(801) 546 2833 MASTERCARD

PRINTERS

C. ITOH

Prowriter



120 cps, 4 fonts (includes proportional), 8 sizes, 160 x 144 dpi, friction & tractor feed. A worthy rival of Epson.

Prowriter.....	\$299.88
Prowriter 2.....	\$719.88

Starwriter

The Starwriter has 40 cps, true Diablo emulation, on 136 columns. Printmaster is the 55 cps version, Serial or parallel interface.

Starwriter.....	\$1219.88
Printmaster.....	\$1670.88

COMREX

ComRiter

Parallel.....	\$869.88
RS-232C.....	\$1009.88

DIABLO

620 & 630

820.....	\$995.88
630.....	\$1030.88

OTC

380Z



Parallel.....	\$1119.88
RS-232C.....	\$1139.88

EPSON

FX, RX & MX



RX-80.....	\$399.88
MX-80 F/T.....	\$499.88
MX-100.....	\$604.88
FX-80.....	\$204.88
FX-100.....	\$CALL

INFORUNNER

Riteman

Parallel.....	\$249.88
---------------	----------

NEC

SpinWriter

3510.....	\$1030.88
3530.....	\$1729.88
3550.....	\$2019.88
7710.....	\$3390.88
7730.....	\$2299.88

OkiData Microline 92

\$524.88 UPS DELIVERED

An exceptional printer (even Creative Computing thought so). The Microline 92 has 80 columns, a 160 cps draft mode & a 40 cps correspondence mode, 10, 12 & 17 cpi, all with double widths, enhanced print (at 80 cps), subscripts, superscripts & backspacing. Full dot addressable graphic capability (72 X 72 dpi) included. Pin & friction feed standard, adjustable tractor optional (\$59.88). RS-232C version has a 2K buffer & costs \$634.88.

Microline 93 (Parallel).....	\$884.88
Microline 93 (RS-232C).....	\$994.88



AutoCals. Features preprogrammed dial & transmit, direct file transfer, 34K capture buffer and certified 2400 baud operation rate. Specify Model I or Model III when ordering.

Microterm	\$79.88
-----------------	---------

STANDARD MICROSYSTEMS

DOSPlus 3.4

The preferred disk operating system for Model I or III. Features BASIC, array sort, multi-key, multi-array, active "00", device routing, DOS command repeat, etc. Specify Model I or III, single or double track, 40 or 80 track drive.

(Mod I).....	\$89.88
(Mod III).....	\$89.88

PROSOFT

NewScript

Forget all those "evaluation" articles. NewScript is the best word processing software available, bar none. NewScript gives you proportional spacing, single and double width type, subscripts, superscripts, underlining, boldface, multiple pitches, full-screen editing, global search/replace, a customized "form" letter that creates its own mailing labels—exceptional performance. NewScript comes with detailed documentation and support from the authors. Specify Model I or III when ordering.

NewScript.....	\$112.88
NewScript Options	
ScriptSit-to-NewScript File Conversion Software.....	\$37.88
Proportional Module.....	\$48.88

CORNUCOPIA

Electric Webster

Electric Webster is a 50,000 word dictionary that features spell checking & a "browse" feature allowing you to choose spellings or to enter your own. Fully NewScript compatible.

Electric Webster	\$134.88
------------------------	----------

Information/Orders: (603) 881-9855

Orders Only: (800) 343-0726

No Hidden Charges:

We pay UPS ground shipping on all our orders, and we never charge extra for credit cards. We accept CODs up to \$1000.88 and a \$10 fee per order. We have a \$50 minimum order. Personal checks are cleared in 3 weeks.

All our equipment is shipped with full manufacturer's warranty. We sell only what we are authorized to sell to insure full warranty support, & we're authorized for warranty work on a number of printers. We also offer extended warranty plans for many printers.

Sorry, we cannot accept open POs or extend credit terms at these prices. APO and foreign orders are not accepted.

We prepared this ad in June, & prices do change, so call to verify them.

OKI DATA

Microline Series



Microline 80.....	\$239.88
-------------------	----------

Microline 82A.....	\$419.88
--------------------	----------

82A/92 Tractor.....	\$59.88
---------------------	---------

82A/92 Roll Holder.....	\$49.88
-------------------------	---------

82A Okigraph ROM.....	\$49.88
-----------------------	---------

82A RS-232C Hi-speed Interface.....	\$129.88
-------------------------------------	----------

Microline 83A.....	\$579.88
--------------------	----------

83A Okigraph ROM.....	\$49.88
-----------------------	---------

83A RS-232C Hi-speed Interface.....	\$139.88
-------------------------------------	----------

Microline 92.....	\$234.88
-------------------	----------

w/RS-232C.....	\$634.88
----------------	----------

Microline 93.....	\$884.88
-------------------	----------

w/RS-232C.....	\$994.88
----------------	----------

Microline 84.....	\$1024.88
-------------------	-----------

Parallel.....	\$1024.88
---------------	-----------

RS-232C.....	\$1134.88
--------------	-----------

MANNESMANN TALLY

MT-180 L



160 cps, 8 fonts (including a correspondence font), parallel & serial interfaces, friction/tractor feed, plus a menu-driven installation for easy set-up from the control panel. This year's sleeper. The MT-180 L is the 136 column version.

MT-180 L.....	\$660.88
---------------	----------

MT-180 L.....	\$CALL
---------------	--------

SMITH CORONA

TP-1



TP-1.....	\$CALL
-----------	--------

SILVER REED

EXP-550



EXP-550 (Parallel).....	\$719.88
-------------------------	----------

w/RS-232C.....	\$759.88
----------------	----------

EXP-500 (Parallel).....	\$459.88
-------------------------	----------

STAR MICRONICS

Gemini 10X/15



Gemini 10X.....	6CALL
-----------------	-------

Gemini 15.....	8CALL
----------------	-------

MODEMS



Lynx

The Lynx is a bus-converting modem, meaning you don't need a RS-232C interface to run it. It's a 0-300 baud modem, originate/answer, that has auto-dial/answer, full/half duplex & comes complete with all hardware & software.

Lynx.....	\$239.88
-----------	----------

US ROBOTICS

Password

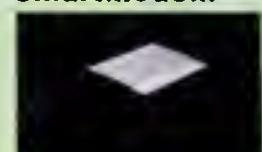


300/1200 baud modem with auto-dial/answer, full & half duplex, LSI technology. Cable included.	
--	--

Password.....	\$379.88
---------------	----------

DC HAYES

Smartmodem



300 or 300/1200 baud direct connect modems with auto-dial & answer, full/half duplex.	
---	--

Comes complete with power supply & modular cable (RS-232C cable optional).	
--	--

(300 baud).....	\$310.88
-----------------	----------

(1200 baud).....	\$330.88
------------------	----------

NOVATION

SmartCat

Latest LSI technology, 0-300 or 1200 baud, auto-dial & auto answer, full/half duplex. Comes complete with power supply & modular cable (RS-232C cable optional).

(300 baud).....	\$100.88
-----------------	----------

(1200 baud).....	\$499.88
------------------	----------

AutoCat

(300 baud).....	\$330.88
-----------------	----------

(1200 baud).....	\$630.88
------------------	----------

Cat

O-Cat (300 baud).....	\$150.88
-----------------------	----------

J-Cat (300 baud).....	\$139.88
-----------------------	----------

SOFTWARE

STANDARD MICROSYSTEMS

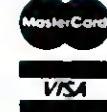
Microterm

A terminal program should support all the "bells & whistles" on a modem. Microterm supports auto-dial/answer modems like the Lynx, DC Hayes Smartmodem or Novation Smart/



HIGH TECHNOLOGY AT AFFORDABLE PRICES
THE BOTTOM LINE

MILFORD, NH 03055-0423 □ TELEPHONE (603) 881-9855



THE COLOR KEY

by Scott Norman

I'll never make it as a businessman. I don't do well when confronted with a page full of numbers because I'm slow to spot trends or unusual relationships in numerical data.

However, I readily understand graphs. I'm much more comfortable when I see data plotted; then I can start to make decisions based on the information at hand.

My contribution to this month's business issue is a Color Computer graphics aid for comparing spending rates with budgetary limitations. The program incorporates ideas useful in other applications, makes good use of the CoCo's graphics capabilities, and fulfills a real need.

Suppose you have a budget that has to last for a given length of time. It could be a monthly household budget, a bank account to see a student through a school year, or (my own application) an annual budget for a research and development project.

As you spend the money, you need to know whether or not your funds will last through the time you originally planned.

At least, you'll want to compare your spending rate to a constant rate that would deplete your resources precisely at the end of the budgeted time period.

You probably want to do more, though. How about using the computer to extrapolate your spending pattern to the end of the budget period, so you can see where your present spending habits lead you? This lets you visualize the effects of changing your spending rate.

I had such a program in mind when I set out to write Expgraph. It proved to be a happy experience: I have a program that meets my needs, and I've used a few favorite routines along the way.

Features of Expgraph

I designed Expgraph (see Program

The Key Box

Color Computer
16K RAM
Extended Color Basic



Graphics for maintaining your budget

Listing) to take as much of the load off the user as possible while retaining a fair

amount of flexibility. The program prepares graphs using reports of dollars spent as of specified dates.

The data represents either period costs (how much you spent between April 1 and May 1) or cumulative costs (how much you spent between the first of the year and the end of January, February, and so on). I receive both kinds of reports in my own work.

In principle, you could graft Expgraph onto other programs; at the least, you could make it read other programs' data files. For this column's purposes, I've incorporated expense information as a cluster of data statements at the end of Expgraph.

As written, the program is equally at home with disk or cassette systems, but it does require Extended Color Basic.

Notice that I haven't entered the data (month, day, year, expenditure) in

Program Listing. Expgraph.

```
1 **** EXPENDITURE GRAPHING ****
2   *
3   *      EXPENDITURE GRAPHING      *
4   *      PROGRAM                   *
5   *                                *
6   *      SCOTT L. NORMAN          *
7   *                                *
8   *      MAY, 1983                 *
9   *                                *
10 ****
99
100 GOTO 200
110 '
119 *** JULIAN DATE ROUTINE ***
120 Y=Y+1900
130 JD=367*Y-INT(7*(Y+INT((M+9)/12))/4)+INT(275*N/9)+D
140 RETURN
198 '
199 *** GRAPHICS CHARACTERS ***
200 NRS(1)="BM+2,-4E206BR4"
205 NRS(2)="BM+1,-5E1R2P1D1L1G3D1R4BR3"
220 NRS(5)="BN+1,-1F1R2E1U1H1L3U3R5BR3B06"
245 NRS(0)="BM+6,-1U4H1L2G1O4F1R2BR4"
250 DL$="BM+1,-1F1R2E1H4E1R2F1BL2B01D0B01BR5"
298 '
299 *** MAIN PROGRAM ***
300 CLS: PRINT#5,"BUDGET COMPARISON GRAPH"
310 PRINT:PRINT" THIS PROGRAM WILL PLOT ACTUALEXPENDITURES AND
GIVE YOU TWO OPTIONS FOR EXTRAPOLATING THE SPENDING RATE TO
THE END OF THE YEAR.
320 PRINT:INPUT" WHEN DID THE FISCAL YEAR BE- GIN (MM,DD,YY FO
RMAT)" ;N,D,Y
330 GOSUB 120
340 J0=J0
350 PRINT:PRINT" ENTER YOUR TOTAL BUDGET FOR THE YEAR. DO NO
T USE COMMAS IN THIS NUMBER."
360 INPUT BG
360 '
369 *** AUTO-SCALING ROUTINE ***
370 D=BG/10:J=D/1E7:E=INT(LOG(D)/2.3026)
380 F=D/10^E:V=10
390 IF F<SQR(50) THEN V=5
400 IF F<SQR(10) THEN V=2
410 IF F<SQR(2) THEN V=1
```

Listing continued

CELEBRATE!



Actually Produced With CHROMAtrs.

CHROMAtrs™

**MAKES IT
HAPPEN**



This powerful peripheral offers you 15 brilliant colors, lets you produce sensational effects the same day you plug it in! Easy-to-use "CHROMA BASIC" gives you 71 CHROMA COMMANDS to use in addition to regular BASIC. You can devise your own exciting games, plot points and lines, do 3-D rotations, translations, create a large range of sprite graphics, produce charts and graphs, and make great sound effects.

This is a quality product that can multiply the value of your TRS-80. Supplies are limited and prices subject to change.

A word to the wise: Order TODAY!

I own a TRS-80 Model I Model III 16K 32K 48K

<input type="checkbox"/> CHROMA BASIC (Previous owners only)	\$30
<input type="checkbox"/> CHROMAtrs assembled & tested, USA	\$199
<input type="checkbox"/> CHROMAtrs assembled & tested, European (except France)	\$230
<input type="checkbox"/> RF modulator with switch box	\$25
<input type="checkbox"/> Mod 1 ribbon cable	\$12
<input type="checkbox"/> Mod 3 ribbon cable	\$14
<input type="checkbox"/> Cassette software	(free with CHROMAtrs)
<input type="checkbox"/> Diskette software	(free with CHROMAtrs)
Subtotal	
N.Y.S. residents add 8.25% sales tax	
Shipping and handling (USA)	
TOTAL	\$7.50

HERE'S NEW LIFE FOR YOUR OLD TRS-80

MOD I &
MOD III



Now You Can Create
Spectacular Color Graphics...
Exciting Sound Effects...
Paddle & Joy Stick Game Action!



ONLY \$199!

(American Version. For European Version & accessories, see coupon below.)

CHROMAtrs™ Comes Complete With:

- 15 vivid colors
- High resolution graphics (256 x 192)
- 2 Atari joystick and paddle connectors
- 3-D animation using sprite graphics
- 16k display RAM
- Programmability in BASIC
- LOGO language subset on disk
- One complimentary game
- Easy-to-understand operating manual
- Does not affect Radio-Shack warranty
- Money-back guarantee

Check one: () Check () M.O. () COD () M.C. () Visa

Account # _____ Exp. _____

Name _____

Address _____

City _____

State _____ Zip _____



MICRO CONTROL SYSTEMS, INC.

(Formerly South Shore Computer Concepts)

1590 Broadway, Hewlett N.Y. 11557
Phone orders accepted (516) 569-4390

THE COLOR KEY

chronological order. Expgraph contains a sorting routine that obviates this protocol.

Also, there is nothing magical about monthly data. The information could represent any interval; in fact, the intervals could vary for a single report. I did make one assumption, though: The budget period covers one year. This sets the scale for the graph's horizontal (time) axis.

The vertical axis is another story. I've enjoyed the opportunity this project has given me to dust off a few favorite subroutines, including one that automatically scales graphs.

Remember the agonies of trying to fit data onto graph paper? It always seems to be divided into the wrong number of sections.

This program incorporates a routine to guarantee that the graph's major divisions represent usable numbers: multiples of two, five, or 10. Furthermore, the total budget figure (supplied by the user at run time) lands in the uppermost division. So whatever your data range, you always use the full video screen.

I formatted the graph using only those elements I find useful. The budget figure appears as a circle on the right edge of the plot, and a straight line connects it to the origin. This represents the constant spending rate that consumes all funds at the year's end. The program plots the user's data as smaller circles connected by straight line segments.

Two methods of extrapolation are available. Expgraph could calculate the average spending rate for the entire period your data covers and plot a straight line at that rate from the origin to the year's end.

You can also specify that the program continue the most recent rate (the rate you spent money in the last interval for which you have data). This alternative shows the effect of any recent changes in spending patterns.

The program does not restrict you to one of these methods. The keyboard polling routine lets you ask for both plots on the same graph, one after the other.

Dissecting the Code

The Program Listing contains a commented version of Expgraph. Stripped of the REMs, the program occupies a little less than 4K, so it's feasible to renumber it and incorporate it into a more

Listing continued

```
420 C=V*10^E:G=0
430 IF J>(G+1) THEN G=G+1
440 R=INT(BG/C)+1
450 IF (ABS(BG/C+1-R))<J THEN B=R-1
460 MX=C*R: SP=MX/150
470 HI=R-G
490 '
499 *** MENU & DATE/S ARRAY ***
500 CLS:PRINT:" TO GET THE PROPER GRAPH,      INDICATE WHICH
TBER THE DATA REPRESENT"
510 PRINT:PRINT TAB(5)"(1) PERIOD COSTS, OR"
520 PRINT:PRINT TAB(5)"(2) CUMULATIVE COSTS"
530 PRINT:PRINT "AFTER THE GRAPH IS DRAWN, PRESS THE 'H' KEY FOR
THE EXTRAPOLA-
TION OPTIONS MENU."
540 PRINT: INPUT" TYPE-OF-DATA SELECTION";NC
550 IF NC<1 OR NC>2 THEN 500
560 READ M:IF M=0 THEN 600
570 N=N+1:ARRAY SIZE COUNTER
580 READ D,Y,A
590 GOTO 560
600 DIM B(N,1): RESTORE
620 FOR K=1 TO N
630 READ H,O,Y,B(K,1)
640 GOSUB 120
650 B(K,0)=JO
660 NEXT K
670 RESTORE
690 '
699 *** SORT BY JULIAN DATES ***
700 P=N
710 P=INT(P/2)
720 IF P=0 THEN 900
730 K=N-P: J=0
740 I=J
750 L=I+P
760 IF B(I,0)<B(L,0) THEN 790
770 T1=B(I,0): T2=B(I,1): B(I,0)=B(L,0): B(I,1)=B(L,1): B(L,0)=T
1: B(L,1)=T2: I=I-P
780 IF I>-1 THEN 750
790 J=J+1
800 IF J<=R THEN 740
810 GOTO 710
890 '
899 *** DRAW "FRAMEWORK" ***
900 PHODE 4,1: PCLS: SCREH 1,1
910 LINE(60,16)-(244,166),PSET,0
920 FOR M=1 TO HI-1
930 Y=166-M*C/SP
940 LINE (60,Y)-(244,Y),PSET
950 SEXT M
960 XO=60:YO=166
970 CIRCLE(244,166-BG/SP),4
980 LINE(60,166)-(244,166-BG/SP),PSET
990 '
999 *** SCALE & PLOT GRAPH ***
1000 FOR K=1 TO N
1010 XK=60+INT((B(K,0)-JO)/2+0.5): B(K,0)=XK
1020 IF NC=1 THEN YY=YO ELSE YY=166
1030 YK=YY-B(K,1)/SP: B(K,1)=YK
1040 CIRCLE (XK,YK),2
1050 LINE (XO,YO)-(XK,YK),PSET
1060 XO=XK: YO=YK
1070 SEXT K
1090 '
1099 *** DRAW S CALIBRATION ***
1100 CS=STR$(INT(166-C/SP))
1110 DRAW "BM10,166R46BL23BD10U0F4L0E4"
1120 DRAW "BM10,"+CS+"R46BL23BU10D0B4R0G4"
1130 DRAW "BM0,162,XDLS,"
1140 CS=STR$(C): L=LEN(C$)
1150 FOR K=1 TO L
1160 IF LEFT$(C$,K)="0" OR LEFT$(C$,R)=" " THEN 1190
1170 V=VAL(MIDS$(C$,K,1))
1180 DRAW "XHRS(V);"
1190 NEXT K
1200 IS=INKEY$:IF IS<>"M" THEN 1200
1290 '
1299 *** EXTRAPOLATION MENU ***
1300 CLS:PRINT@10,"* OPTIONS *"
1310 PRINT:PRINT" TWO KINDS OF EXTRAPOLATION ARE AVAILABLE:"
1320 PRINT:PRINT "(1) 'AVERAGE SPENDING RATE' LINE, OR"
1330 PRINT:PRINT "(2) LINE THROUGH THE LAST 2 DATA POINTS ONLY"

```

Listing continued

Listing continued

```

Y"
1340 PRINT:INPUT "YOUR CHOICE":EX
1350 IF EX<1 OR EX>2 THEN 1300
1360 SCREEN 1,1
1370 ON EX GOTO 1400,1500
1397 '
1398 ***** "AVERAGE RATE" ****
1399 ***** EXTRAPOLATION ****
1400 B(0,0)=60: B(0,1)=166: SL=0
1410 FOR K=1 TO N
1420 SL=SL+(B(K,1)-B(K-1,1))/(B(K,0)-B(K-1,0))
1430 NEXT K
1440 SL=SL/N
1450 YI=166+SL*104
1460 IF YI<2 THEN 2000
1470 LINE(60,166)-(244,YI),PSET
1480 I$=INKEY$: IF I$="M" THEN 1300 ELSE 1480
1497 '
1498 ***** "LAST-2-POINTS" ***
1499 ***** EXTRAPOLATION ****
1500 SL=(B(N-1,1)-B(N,1))/(B(N,0)-B(N-1,0))
1510 YI=B(N,1)-SL*(244-B(N,0))
1520 IF YI<2 THEN 2000
1530 LINE (XK,YK)-(244,YI),PSET
1540 I$=INKEY$: IF I$="M" THEN 1300 ELSE 1540
1997 '
1998 ***** GOING BROKE! *****
1999 '
2000 CLS: PRINT @9, "*** WARNING ***"
2010 PRINT: PRINT" EXTRAPOLATED SPENDING RATE IS BADLY OFF-SCALE.  
PLEASE CHECK YOUR FIGURES!"
2020 PRINT" IF FIGURES ARE CORRECT, THE EXTRAPOLATION CAN BE  
BROUGHT BACK ON-SCALE BY SPECIFYING A FICTITIOUS ENLARGED BUDGET."
2030 END
4999 '
5000 DATA 1,31,83,1000
5010 DATA 2,28,83,2000
5020 DATA 3,31,83,3000
5030 DATA 5,31,83,5000
5040 DATA 4,30,83,4000
5050 DATA 0

```

comprehensive financial management package.

The REMs all have line numbers like 198 and 399, and are not referenced by GOTOS or other control transfers. Feel

free to delete them.

Exgraph is written in a fairly linear fashion, except for one odd move at the beginning: the jump around the routine at line 120. This routine calculates the

Julian equivalent for all dates of interest to the program (the program computes time intervals by subtracting Julian dates), so you might call it often. I wanted it near the beginning of the program to speed up execution, hence the jump.

The program uses the string variables in lines 200-250 to draw a dollar sign and to calibrate the scale for the final PMODE 4 graph. The techniques for drawing text on a high-resolution graphics screen are well known by now; these particular characters are from the set 1 defined in a previous article (*80 Micro*, Anniversary Issue 1983, p. 469).

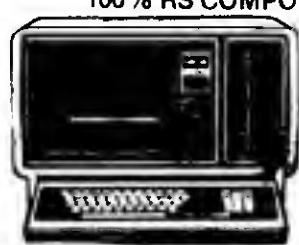
Notice that the numerals (NR\$(1), and so on) are elements of an array. Exgraph doesn't need the other elements since it doesn't label every division of the graph, but this is a handy way to organize data. It makes life simpler when you call up the graphical equivalents of each digit in a number.

As far as the user is concerned, the program begins at line 300. That queer spacing in the text of the menu is necessary for an attractive screen display.

The program calls for only two pieces of information: the starting date for the year and the total budget. Enter the date as:

Month,Day,Year

You need one or two digits for the month and day, and two for the year; the program adds the 1900. (Readers who expect to be concerned with the



MOD 12

1 DR 80K \$2499
2 DR 80K \$3149



MOD 4

16K Ext. Bas. \$ 799
64K 2DR RS232 \$1579



MOD 16

1 DR 128K \$3898
2DR 128K \$4510

CASHIERS CHECK OR MONEY ORDER MUST ACCOMPANY ALL ORDERS

(817) 825-4027

NOCONA ELECTRONICS • P.O. Box 593 • Nocona, TX 76255

-232

THE COLOR KEY

21st century can modify line 120 when the need arises.)

Now the auto-scaling routine at line 370 takes over. This is a modification of a more general routine published in the December 15, 1981 issue of *Electronics* (p. 159).

I've simplified it by assuming that the graph shows only positive numbers. You start with zero expenditures and spend up toward your total budget.

The routine starts by trying to fit the budget figure onto a graph with 10 major divisions. If this requires the divisions to have unacceptable values (i.e., not one, two, or five times an integer power of 10), the program automatically adjusts.

The final graph might have an unusual number of divisions, but they will be a convenient size. The program plots the history of a \$775,000 project on an eight segment display, with every segment corresponding to \$100,000.

The variable C (line 420) is the dollar value associated with each major division of the graph; you need it later in the labelling routine. MX (line 460) is the maximum value you can show on the graph, and is equal to C times the number of major divisions.

I decided that the graph for Expgraph would be 184 positions wide and 150 high. The conversion between dollars and vertical coordinates on the screen is governed by a scale factor SF, equal to MX/150. The final variable in this routine is NI, the number of major vertical divisions.

The 184-position width provides a reasonable fit to a two days/position scale. If you want to use Expgraph for some other period of time, change this when you get to the plotting routine.

Once the program calculates the scaling factors, it moves to the second menu at line 500. This asks the user how to interpret the data.

To make a sensible graph, you have to know whether each piece of data represents the total money spent since the beginning of the year or since the end of the last reporting period. The selection variable MC is used in the plotting routine.

The user doesn't need to keep track of how many data points are to be plotted. The program checks in lines 560-600, and sets up a data array of the appropriate size. Note that a DATA 0 sets up a simple out-of-data test. If you use another technique, such as a disk file, to

supply information to Expgraph, you must modify this.

The data array B(K,J) is $N \times 2$ in size, where N is the number of data points. The first subscript ranges from 1 to N, while the second takes the values zero and 1. B(K,0) is the Kth Julian date, while B(K,1) is the corresponding expenditure figure.

Now the program reads the data statements a second time to add data to the array (lines 620-670). It calculates the Julian dates and puts the array in order using the Shell-Metzner sort in lines 700-810.

Ordinarily, financial data is available in chronological order, but you might not be able to enter a report in the proper sequence. Expgraph frees you from having to worry about this.

Lines 900-980 set up the outline of the graph, draw horizontal lines at the major divisions, and plot the budget figure and the straight line connecting it to the origin. Lines 1000-1070 plot the actual data points and connect them.

There isn't much to say about the plotting routine. It scales the Julian dates to the graph coordinate system in line 1010, and scales the financial figures in line 1030.

Variable names XK and YK are the same as B(K,0) and B(K,1), but I wanted to shorten the notation for some of the plotting instructions.

The graph is even more useful when the program calibrates the dollar scale in lines 1100-1190. The program finds the vertical position of the first major division line and converts it to a string in line 1100. Expgraph uses the string in a Draw command (line 1120) to locate a fiducial mark: a horizontal line segment with a down-pointing arrow.

Line 1110 draws the complementary line, complete with an up arrow, aligned with the lower edge of the graph. This sets up a gap one major division high, into which you write the dollar value of that division—\$1,000, \$50,000, or whatever. Line 1130 even draws the dollar sign.

Lines 1140-1190 convert the variable C to a string, analyze it one digit at a time, and draw the NR\$ variables corresponding to each digit. The Execute option of Extended Color Basic's Draw command comes into play here.

Line 1160 is necessary because Basic wants to lead off with a blank when converting a number to a string. Without it, the calibrations all start with

a leading zero.

With the zero suppressed, and with the screen coordinates I've chosen for the graph, you have enough room for a six-digit number plus the dollar sign. Expgraph can properly label a major division of up to \$500,000.

Now that the raw data is graphed, press the M key to get to the third menu for extrapolation options. The average-expenditure-rate method assumes that all reporting intervals are of equal length. At this level of accuracy, such an assumption isn't unreasonable if the reporting intervals are months of the year. You shouldn't use this method if you mix monthly and weekly data, though.

Should either extrapolation method indicate that you are headed for disaster, with anticipated expenses far in excess of your budget, the program gives you a warning message (lines 2000-2030) and throws you off.

Serves you right.

Final Thoughts

One word of warning: If you get into this type of graphics data presentation, be careful about the positive and negative signs of vertical distances on the screen.

The Color Computer uses an inverted coordinate system: The positive direction for vertical measurements is down. This causes me a few headaches whenever I start a new graphics project.

Expgraph has been a workhorse for me. I can't claim that the extrapolations are accurate to six significant figures, but they're good enough to tell me when a real budget problem is in the making—something I might not notice in columns of numbers.

Other users might want to spruce up the display a little. You might like to add a title, or vertical lines to indicate the end of each month or another reporting interval.

You might even want to add more labels to the dollar scale. Of course, if you do that you need a complete set of numerals for your draw statements. ■

Scott Norman welcomes reader response to *The Color Key*. Write c/o 80 Micro, 80 Pine St., Peterborough, NH 03458.

Turn Your Color Computer into *SUPER* Computer

Color Computerists



HOT CoCo. The exciting new monthly magazine for the TRS-80 Color Computer*. It promises to transform your low-end machine into a high-resolution superstar.

HOT CoCo is the brainchild of Wayne Green, the publisher of *80 Micro*. The information in **HOT CoCo** is first rate with monthly columns and reviews that focus on valuable money-saving techniques. Time savers too! Plus problem solving articles on:

- Utilities—patching, aiding, troubleshooting
- Graphics—graphs and patterns
- Hardware—interfacing and enhancing
- Games—fun and strategy
- Programming techniques and tutorials
- Coverage of home use, business, communications and education applications

Best of all, **HOT CoCo** is written by users just like you. The material is always up-to-date and useful. Hardware, software, books... what's new... what's best... what works.

All this is yours for the affordably low subscription rate of \$24.97. With pre-payment (check or credit card), you'll receive

a 13th issue FREE! Use the attached order form, the coupon below, or call toll free **1-800-258-5473**.

Turn your mild-mannered machine into a *SUPER* computer. Subscribe to **HOT CoCo** today.

YES! *I want a subscription to HOT CoCo at \$24.97.*

I understand that with payment enclosed or credit card order, I will receive a FREE issue making a total of 13 issues for \$24.97.

MC VISA AE CHECK/MO BILL ME
CARD# _____ EXP. DATE _____

SIGNATURE _____

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Canada and Mexico \$27.97, 1 year only. US funds. Foreign surface \$44.97, 1 year only, US funds drawn on US bank. Please allow 6-8 weeks delivery.

HOT CoCo•Box 975•Farmingdale, NY 11737

339FB

*TRS-80 Color Computer is a trademark of Radio Shack, a division of Tandy Corp

HOT CoCo

A Star is born...

The PRODUCERTM

The Professional Program Writer.

Now Available for the Model I & Model III
With 48K and 2 Disk Drives

(Please specify Model I or III)

Coming soon for the Model II, Apple II and others...

\$149.95

...Now Introducing
The PRODUCER, Jr.

See Technical Description and Order Form page 11

Only \$89.95



If BASIC somehow doesn't seem so basic, and your software has been getting you nowhere, then let me introduce myself. THE PRODUCER is my name. Writing programs is my game. If you're interested in an inexpensive way to quickly and easily write professional quality custom software programs, then read on.

Have you ever wasted money on software that didn't do what you thought it would? Are you burned out on high priced, canned programs that make big claims, but don't meet your needs. Has a lack of good software made your computer an expensive gadget that doesn't do what you hoped it would? If so, I'm here with good news. With my help you can put those problems behind you.

What is THE PRODUCER?

In short, I'm a Program Generator designed to write customized software programs. If you have a need to store and retrieve information, perform calculations on your data and get displayed or printed reports, I can help you develop a program to do just that, in just about any format you can imagine. That's why I'm called a program development system. I'm a powerful and sophisticated software package, born of vast technical knowledge and professional design experience. Yet, I'm the most simple, practical, easy to use and functionally versatile program generator ever put on the market.

What can THE PRODUCER do for you?

How can I help you? Just let me count the ways.

1. I make programming easy. I'm 'user friendly.' If you can answer simple English questions and push buttons, I'll do all the hard work. Let me worry about the BASIC language required to complete your program. Describe the program you want and I'll write it for you. The process is simple. First, I produce a printed planning sheet to help you get your ideas on paper. When you've finished planning, you're ready to draw your screen right on the monitor. The Screen design and appearance is completely at your command, including graphics. You have full editorial control. Make all the changes you like, until you're satisfied. After you're thru, I'll guide you thru some simple English questions about your Screen. Based on your answers, I'll write a complete BASIC program for you.

2. I can save you 100's of hours of time. I provide real short cuts to meet your needs by going direct from your idea to a 'ready to use' customized program. I write all the BASIC code for you. I'm simple, but I'm not shallow. The only limit to my capacity is your imagination.

3. I can save you big bucks. You may never need to buy another program to store and retrieve your data. With my help, you can design your own custom programs to get your job done.

4. I can help make you more productive. Having me as your partner will be like taking a smart pill. I'll pay for myself many times over by increasing your productivity and creativity. With my custom programs serving you, your computer will be the valuable friend you hoped it would be.

5. I can help make you a real pro. Based on your ideas, I write complete stand alone programs. I write in BASIC code, but you talk in English to me. And if you're an entrepreneur, you can sell the programs you and I create. As a licensed owner of THE PRODUCER, you may do so without paying royalties.

6. I can make good programmers much better. I produce fully commented BASIC code so you can use me as a building block to write your own specialized software. I have the best screen and input module available anywhere at any price.

PRODUCER Generated Programs

We understand your reluctance to invest in THE PRODUCER until you know for sure it provides what we say it does. The programs below are unmodified, finished programs generated by THE PRODUCER. Our customers tell us that PRODUCER generated programs are better than many high priced programs written by human professionals. Compare these programs to any you have seen selling at a similar price. Their quality will surprise you. Buy any of these PRODUCER generated programs now and we will gladly apply the cost of that program toward the future purchase of THE PRODUCER. Or buy THE PRODUCER now and select one of the PRODUCER generated programs to be included in your order, absolutely FREE.

Executive Scratch Pad	\$29.95	Inventory 1	\$39.95
Expense Notebook	\$19.95	Maintains group of identical items	
Teacher's Grade Book	\$29.95	Inventory 2	\$39.95
Recipe Program	\$19.95	Maintains record for individual items	
Photo Assistant	\$29.95	Record Library	\$19.95
Video Library	\$29.95	Organizes your music center	
Mailing List	\$19.95	Reader's Guide	\$19.95
Personnel Program	\$39.95	Organizes magazine articles/clippings	
See descriptions in March and April Issues of 80 Micro		Personal Checking	\$29.95
		Organizes checking accounts	
		Loan Calculator	\$39.95
		Calculates loans, principal and interest	

What do you get with THE PRODUCER?

1. Two diskettes containing THE PRODUCER program development system, and a complete disk operating system. Also included is a free sample personal management program (value \$59.95) useful to every computer owner.

2. Extensive documentation in a three ring binder, with index tabs, quick reference system, comprehensive index and sections for the novice and professional programmer.

3. Complete printed tutorial, walking through each step in THE PRODUCER process and resulting in a finalized sample program. An audio cassette tape (\$14.95 value) of the tutorial session is also provided free for a limited time.

4. A toll free technical assistance number for PRODUCER owners.

5. A free one year subscription to THE PRODUCER's quarterly newsletter containing ideas, sample programs and update information related to THE PRODUCER.

TECHNICAL COMPARISON CHART

	PRODUCER	IR.	QUICKPRO	CREATOR
--	----------	-----	----------	---------

FEATURES OF THE FINISHED BASIC PROGRAM

Full Screen Oriented Input of All Fields	YES	YES	NO	NO
Edit without Retyping with Insert & delete	YES	YES	NO	NO
Restrict field Length automatically	YES	YES	YES	NO
Unlimited Restriction choice for each field	YES	YES	NO	NO
User defined Custom Prompts for each Field	YES	YES	NO	NO
Full Speed Typing in ALL Fields	YES	YES	NO	YES
Immediate Exit from Any Field to Menu	YES	YES	NO	YES
Enter Fields from last Record automatically	YES	YES	NO	NO
Fast BTREE File Structure (No Sort Needed)	YES	YES	NO	NO
Find Record with Part of a Key	YES	YES	NO	NO
Hi-Speed Global Search for ANY Field in a Record	YES	YES	NO	NO
Duplicate Keys and Multiple Keys Supported	YES	YES	limited	NO
Global Field Replacement Function	YES	YES	NO	NO
Run Predefined Reports from Finished Program	YES	YES	NO	NO
Select Reports from Menu in Finished Program	YES	NO	NO	NO
Sort (machine language) ANY Field-Free	YES	NO	NO	NO
Custom Mailing Labels Option (any Size)	YES	NO	NO	NO
Do Calculations on fields in Program	YES	YES	YES	NO
Sell Finished Program with No Royalty	YES	YES	NO	NO

PRODUCER CAPABILITIES & FEATURES

Toll Free Question Line	YES	YES	NO	NO
Create PROFESSIONAL Finished Program	YES	YES	NO	NO
Modify Program without Starting Over	YES	YES	NO	NO
Ease of Use, including Complete TUTORIAL	YES	NO	NO	NO
Number of Calculations allowed per field	8	8	1	0
Use Field Names for Calculations	YES	NO	NO	NO
Use ALL Math Functions in Calculations	YES	NO	NO	NO
Generates a BASIC Program	YES	YES	YES	YES
Custom Design exact Screen YOU desire	YES	NO	NO	NO
Full Feature Screen Generator (graphics)	YES	NO	NO	NO
Easy Report Generation with Any Restrictions	YES	NO	NO	NO
Complete & Thorough DOCUMENTATION	YES	YES	limited	NO
Detailed Quick Reference Materials	YES	YES	NO	NO
Audio Cassette Tutorial Available	YES	NO	NO	NO
Program Planning Form Provided	YES	NO	NO	NO
Sample Programs Available before Purchase	YES	YES	NO	NO

FREE UTILITIES INCLUDED

Free Menu Driven DOS Utility Package	YES	YES	NO	NO
Free Disk Operating System (Super Fast)	YES	YES	NO	NO
File Rebuilder & Reorganizer included Free	YES	NO	NO	NO

Send Cashier's Check, Money Order or Certified Check to: **\$149.95**

PRODUCER SOFTWARE

A division of Texas Computer Systems, Inc.

P.O. Box 1327 Arlington, Texas 76004-1327

Or For Master Card - Visa - American Express

Call 1-800-433-5184 Texans Call 817-274-5625

The PRODUCER, JR.

If you don't need all the features of The PRODUCER—the professional program writer, and you don't want to spend \$149.95 on software, READ ON. Producer Software has the perfect solution for you.

THE PRODUCER, Jr.

A SIMPLE TO USE professional program generator. And it's only \$89.95. This self documented program generator can have anyone creating self-contained, stand alone programs in no time at all. No other program generator can provide you with ease of use, low price and quality.

FEATURES

- screen generator allows easy definition and creation of fields
- B-tree file lets you search, insert, delete and edit
- reports by single restriction (no sort)
- much more (see technical comparison chart)

The PRODUCER, Jr. comes to you complete with all the above features and its own operating system for only \$89.95. But don't let this low price fool you--The PRODUCER, Jr. is still the most powerful program generator on the market today, with the exception of the original PRODUCER. And The PRODUCER, JR. is completely compatible to the original PRODUCER so if you decide to upgrade at a later date you may do so for only \$75.00. So don't miss out. Order today.

*For an independent product review of the PRODUCER see page 62 of March issue of 80 Micro



Photo 1. The MC-10.

★ ½

Model MC-10 Micro Color Computer
Tandy/Radio Shack
One Tandy Center
Fort Worth, TX 76102
\$119.95

by Beve Woodbury

Radio Shack's new MC-10 Micro Color Computer is a good computer on which neophyte users can learn Basic programming. It's reasonably priced, fairly versatile, and accepts Basic commands from a single key-stroke. But its versatility is limited by a small (4K) memory capacity and a lack

of software.

The MC-10 is aimed at the low-end market currently dominated by the Timex-Sinclair 1000 and the VIC-20. Each computer has advantages and disadvantages, but the MC-10 comes out last in my opinion.

Physical Description

The MC-10 has an ivory case. It's 2 inches high by 8½ inches long by 7 inches wide, and weighs a little under 2 pounds (see Photo 1). It generates eight colors on a 32-character by 16-line display. You can display text and graphics on the same screen.

This computer has a cassette recorder port (see Photo 2), an RS-232C port for

REVIEW CONTENTS

Model MC-10 Micro Color Computer	38
Liberator	41
Computer Programming for Kids/Basic Programming	42
The Executive Calculator	44
Maryland Model II Games	46
The Genie in the Computer	48
Maxi Stat	50
Games at a Glance	50
The Home Accountant	56
TRS-80 for Kids from 8 to 80	62
Forms III/Prosort III	62
Optimal Manager	64

Our reviewers use a five-star rating system. One star represents the low end of this spectrum, while five stars represent the spectacular and high end of the spectrum.

a printer or telephone modem, and a port for inserting an optional 16K RAM module. It doesn't have a port for joysticks or EPROMs.

The MC-10 comes with an antenna switch that connects to a TV, the connecting cable, a manual, a quick reference card, and a bulky, heavy power supply you must use to connect the computer with a wall outlet.

According to Tandy, the keyboard is "standard typewriter style." The keyboard letter/number format is standard, but the keys are the small chiclet style that would horrify any touch typist.

The keys are well labelled. Regular and special characters are identified on each key, and Basic commands appear on the panel above the key. You access special characters, such as the 16 graphics characters, by simultaneously pressing the shift key and the character key.

You access Basic commands by simultaneously pressing the control key and the key associated with the desired command. The control key is in the lower left corner, and the shift key is in the lower right corner. The enter key

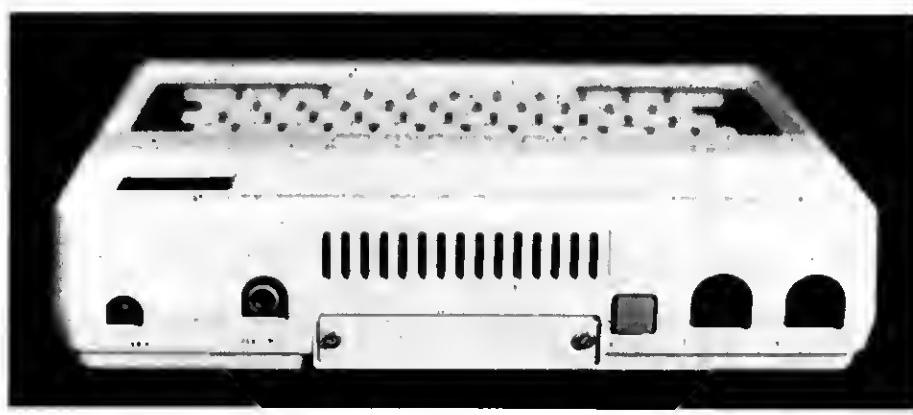


Photo 2. A rear view of the MC-10.

and the break key are also on the far right of the keyboard.

I was immediately ready to dislike the keyboard, but the more I used it in programming, the more I liked it. It is definitely a one-hand keyboard. All but the smallest of hands can span it to press the shift or control key and any other key.

This leaves one hand free to follow any text you're copying. The MC-10's size could be a great advantage to anyone handicapped by the use of only one hand.

Once I became familiar with the keyboard, I could type in a program much more quickly than usual. Each Basic command requires only one keystroke, thus eliminating typos in the command words.

You don't need to type CHR\$(n) for graphics, although the command is available. The background color of the graphics character is determined by the color of the cursor when you press the shift and graphics keys.

Change the color of the cursor by pressing control and the zero key. The color changes each time you press the keys, cycling through the full range of colors. These three options greatly reduce programming and debugging time.

Several keys have special functions when you use them with the control key. The Q key deletes the current program line. The A key erases by backspacing. The W key produces exponentiation. The S and Z keys are "reserved for special purposes" that Tandy has yet to define.

The shift key with the @ key pauses a program. The shift key with the zero key switches the keyboard between upper- and lowercase modes.

Lowercase letters don't appear on the screen. The MC-10 prints lowercase letters in reverse video: green letters on black background. They should appear on a printout, but I couldn't test the printing capabilities as I don't have access to a serial printer.

The reset button on the back of the computer clears the screen or gets you out of a hang up while retaining the program and variables in memory.

The MC-10 can also generate music, or noise, depending on the listener's perspective. The lowest musical note is approximately the E below middle C, moving up 255 tones to the very high tones. This sound capability could be useful in detecting early high-sound hearing disabilities.

Like the machine, the manual is compact and easy to understand. The information is presented in a factual, instructive manner without all the cartoon features of the CoCo manuals. The documentation has a good table of contents, but no alphabetical index to help locate specific information.

A novice can start at the beginning of the manual setting up the computer and its accessories, then progress smoothly to programming. The Basic commands appear in logical order, starting with Print commands and ending with mathematical functions. The explanations are detailed, and include sample program lines and simple programs.

Evaluation

The MC-10's portability is definitely an asset. You can use it wherever you

"The MC-10 is useful for learning Basic, but it does have many disadvantages."

have access to a television. My teenage users commented that it would easily fit into their book bags.

If you plan to connect your MC-10 to a motel television, be sure to check with management first. Many motels have silent alarms connected to their television cables.

The MC-10 is useful for learning Basic, but it does have many disadvantages.

The lack of automatic line numbering slows program entry, and no edit mode exists to aid debugging. This is frustrating when you make a typing error at the end of a long line. You have to retype the entire line, possibly creating more typing errors.

The MC-10 has no means of using files. This severely limits programming use. The closest you can get is to use an array as a file. You can set up an array in a program with string or numeric characters.

You can save an array of numeric characters on tape using the CSAVE* command, then load it back for future use with the CLOAD* command. This lets you simulate data files limited to numeric data.

Even if file input/output becomes available, it would be difficult to use the MC-10 for any application that requires keyboard input. One-handed data entry on a miniature keyboard is difficult and error-inducing.

The computer has no Else command, and program line length is limited to 127 characters.

Also, the MC-10 doesn't control the motor (start/stop) on the cassette recorder. You must manually turn the recorder on and off.

All these disadvantages are probably due to the limitations of MC-10 memory size. I expect Tandy to come out with an Extended Basic add-on that will include automatic line numbering, the Else command, cassette motor control, and expanded graphics commands such as Line, Print, and Paint.

It would be beneficial if you could use CoCo program tapes on the MC-10 and vice versa. However, the CoCo runs on a 6809 ROM chip and the MC-10 runs on a 6803 ROM chip. These two chips require different Basic command tokens.

(A Basic command is tokenized in memory so it fits in 1 byte of memory, regardless of the command's length. Of and Restore each occupy 1 byte.)

The MC-10 loads a tape written on the CoCo and vice versa, but the different command tokens produce strange programs. For example, Print on the MC-10 becomes Data on the CoCo, and Next becomes End.

All things considered, the MC-10 is up against some stiff competition. You can purchase the 1K Timex-Sinclair 1000 with a 16K RAM add-on for approximately the same price as the 4K MC-10. And the Timex-Sinclair accepts 63 one-keystroke commands and generates 20 graphics characters.

I prefer the real keys on the MC-10 to the membrane keys on the Timex-Sinclair 1000 and I think the MC-10 has a clearer manual. The Timex-Sinclair 1000 doesn't have color, but you can program it in Assembly language.

The larger memory (at the same price) and the ability to use Assembly language give the Timex-Sinclair 1000 a decided advantage if you're willing to

sacrifice color and real keys. Both are primarily learning computers and have limited expansion capability.

The 5K Commodore VIC-20 is close to the MC-10. I've seen it for \$159.95, but know it's been on sale for under \$100. The VIC-20 isn't as portable; it's about three times the size of the MC-10 and has a heavy power supply unit.

The added size provides room for expansion. In addition to cassette and serial ports, the VIC-20 has a joystick port, a cartridge port, and a port for special accessories. You can use the serial port for a printer or a disk drive. You can also expand memory to 32K.

The VIC-20 has a true typewriter-style keyboard with access to 60 graphics characters and eight colors. Uppercase and lowercase letters appear on the screen.

You can also choose from 16 screen colors, eight border colors, and eight graphics colors. Even letters can appear in one of eight colors. The VIC-20 has high-resolution graphics and each pixel is separately programmable.

One-keystroke Basic commands are not available on the VIC-20. This makes program typing more difficult and time consuming, but the real keys make data entry much easier. File input/output is available, so the VIC-20 is a more practical computer for data handling or business use than the MC-10.

The screen display is 22 characters wide by 23 lines long. This causes the characters to appear spread out and distorted. I found text displays quite unpleasant and difficult to read on the screen.

Rumor has it that the Timex-Sinclair 2000, the U.S. version of the English Spectrum, will be released in October. If it's really like the Spectrum and sells for under \$200, it might be worth considering.

The Spectrum is a color computer with high-resolution graphics and 16K RAM. The screen display is 32 characters wide by 24 lines long. The keyboard is almost standard-size with chiclet-style keys.

You can enter Basic commands and graphics with one keystroke. The Spec-

trum is expandable to 48K RAM, and disk drives and printers are available for it.

Perhaps some of Tandy's products for the MC-10 will help make it more competitive with the other low-end computers. As I write this review, Tandy is advertising games and personal time saver programs from a library of ready-to-run MC-10 cassette software. They are also touting a \$49.95 16K RAM add-on.

Unfortunately, advertising has preceded availability, and Radio Shack Computer Centers aren't sure when they'll have the software or expansion RAM. These products might be available by the time you read this article. I'm hoping that Tandy will soon offer telecommunication software (which will require the purchase of a modem) and Extended Basic.

The MC-10 is a good, compact, portable computer severely limited by its 4K size. You should evaluate future expansion capability and cost, as well as the competition, before rushing out to

Gold Plug - 80

Ahhh, instant relief! At last there is a permanent cure for contact oxidation on Model I edge connectors. Many TRS-80 users are familiar with the symptoms: untimely resets, spontaneous reboots, or the inability to get the computer started at all without a frustrating session with a pink eraser.

The Gold Plug 80 is a well made device consisting of an edge-card plug with gold plated contacts, available with either 34 or 40 contacts. The rear of the plug has ter-

TRS - 80 + MOD I, MOD III, COCO

minal tabs which fit exactly over the existing foil fingers on the TRS-80's connectors. After installation, the original plugs have been extended about a half inch, meaning that the plastic door covers no longer fit. This did not trouble me, but you should take it into consideration. E.A.P.'s advertising leaflet, by the way, cautions you about the doors, which is refreshing. They also have the excellent policy of permitting you to return any plugs ordered for a refund if after seeing them you are un-

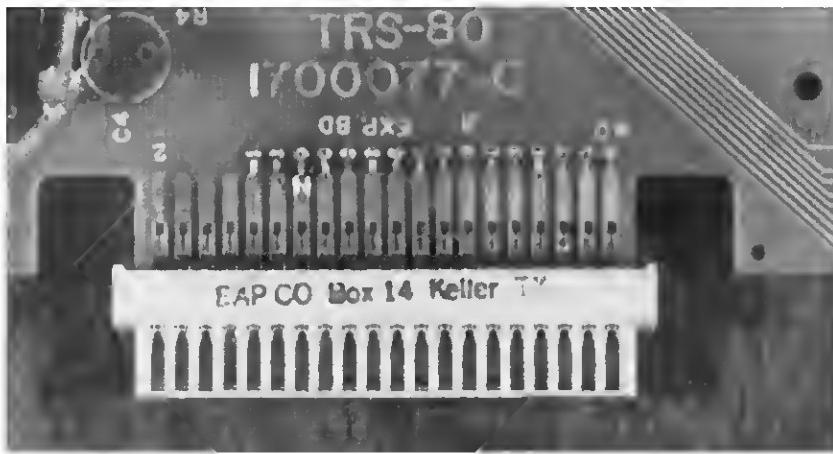
willing to undertake the installation.

An excellent set of instructions accompany the plugs, and they are shipped promptly. I ordered mine by mail on a Monday and received my set of plugs by first class mail on Tuesday of the next week.

Installation

Installation requires a soldering iron (I use a 40-watt Weller), Rosin-core solder, a Phillips screwdriver, and your last Pink Pearl. The keyboard and Expansion Interface have to be disassembled to get at the connectors, which are then cleaned—the eraser's last fling. The Gold Plug 80 is fitted over the existing plug with the contacts centered, and then soldered to the board. I have some soldering experience, but it proved to be an easy, safe job. The contact is heated, a very small amount of solder applied, and then you go on to the next contact. It took about an hour to do all six plugs.

GOLD PLUG 80 Mod I (6)	\$ 54.95
Keyboard/EI (mod I)	16.95
Individual connectors	9.95
COCO Disk Module (2)	18.95
Disk Drives (all R.S.)	9.95
Gold Disk Cable 2 Drive	29.95
Four Drive Cable	39.95
GOLD PLUG 80 Mod III (6)	54.95
Internal 2 Drive Cable	29.95
Mod III Expansion port	10.95
USA shipping \$1.45 Can/Mex \$4.	
Foreign \$7. TEXAS 5% TAX	



The Gold Plug 80

GOLD PLUG 80-E.A.P. COMPANY
P.O. Box 14 Keller, TX 76248 (817) 498-4242



VISA

E.A.P. CO.
P.O. BOX 14
KELLER, TEXAS 76248
(817) 498-4242
MC/VISA

purchase one.

If a beginner becomes really interested, he'll quickly outgrow the MC-10's capabilities. He'll have to de-

cide whether to purchase a new computer that can grow with his interest, or whether the MC-10 will satisfy him and at what cost.

On the other hand, if the beginner who buys an MC-10 finds no lasting interest in computers, he won't be out several hundred dollars. ■

★★★★

Liberator
John Crane
Computer Shack
1691 Eason
Pontiac, MI 48054
Model I, III, and 4
\$19.95 cassette
\$24.95 disk

by Michael E. Nadeau

Yes, this is another Donkey Kong clone. But if Donkey Kong is your game, Liberator is the best of the lot for the Models I, III, and 4.

The game's plot pits you, a "brilliant scientist," against your own robot,

which has gone haywire. You must work your way through an industrial complex where the robot is holding your helpers captive.

You climb ladders, hop elevators, jump barrels, and dodge drone robots in the attempt, at speeds fast enough to keep you on your toes, but not so slow that you easily master the game. You'll find it difficult to predict the frequency of the rolling barrels and movements of the drones; this adds to the game's challenge.

Liberator has five different screens and a total of four captive helpers. (You guessed it; they are young, helpless, and female. On the TRS-80, though, they look more like young, helpless fire hydrants. Computer Shack should have left the sex of the helpers up to the game

player; after all, women play arcade games, too.)

On too many games that involve moving a player up and down ladders it's difficult to get the player properly aligned on the ladders. This is frustrating. With Liberator, I found it quite easy to get the player to move as I wished.

You control your player's direction with the arrow keys and make him jump with the space bar—a comfortable arrangement. The program permanently stores the top 10 scores, and the same disk boots on the Models I, III, and 4.

Liberator's documentation is brief and adequate. And, as usual with Computer Shack programs, the package is professionally presented with striking artwork.

MICRO-DESIGN

If you don't know the number, you should.

UPGRADE

TRS 80, Model 4 SYSTEM UPGRADE INCLUDING THE EXCEPTIONAL MDX-6 DISK CONTROLLER, ONE 40 TRACK Disk Drive, Cables AND HARDWARE.

\$399.95

COMPLETE

MDX-5

\$159.95

Fully Assembled
MDX-5 System

FOR THE MODEL 4 USER who
ALREADY HAS FLOPPY DISK THIS IS
THE PHONE MODEM &
SERIAL PORT FOR YOU!!

MDX-2

\$469.95

Fully Assembled
System with CASE

\$74.95

BARE BOARD &
USERS MANUAL

MDX-6

\$129.95

Fully Assembled
MDX-6 System

MICRO-DESIGNS STAND ALONE
FLOPPY DISK CONTROLLER
BOARD FOR YOUR MODEL 4.

\$49.95

BARE BOARD &
USERS MANUAL

For Free Information Call (Toll Free) or Write
6301 MANCHACA Rd. SUITE B. AUSTIN TX. 78745

1-800-531-5002

Texas Res. 1-512-441-7890

- ADD
- CHANGE
- DELETE
- SORT
- SELECT
- SAVE
- PRINT
- COMPUTE
- REPORT
- MERGE



\$20.00

Why would SofTrends offer its award-winning AIDS-III data management system to the general public at a tiny fraction of its original price? The same version featured in the two-part series, "Inside AIDS-III" (80-MICRO, March & April, 1983)? Simple. To acquaint you with the best, little software-publisher in the business. To order, call (216) 289-2002 and use your VISA/Master Card. Or send your check or money-order for \$20 (shipping included!) to SofTrends, Inc., 26111 Brush Ave., Euclid, OH 44132. Sorry, no C.O.D.'s or P.O.'s accepted for this special offer.

SOFTRENDS

492

REVIEWS

My only complaint about Liberator is that the difficulty level doesn't seem to increase with your score. Computer Shack ads claim that the game has 20 levels of play, but my copy doesn't seem to have this feature.

Computer Shack might be referring to the sequence of the five screens. Each screen differs in complexity. The different screens seem to appear randomly

at first, but the ratio of difficult to easy screens increases as your score gets higher.

Even without increasing the level of difficulty, Liberator still presents a challenge each time you play it. With the price of arcade-style games so high, their staying power is an important consideration that makes Liberator a good value. ■

★ ★ ★

Computer Programming for Kids and Other Beginners on the TRS-80 Computer

Royal Van Horn
Sterling Swift Publishing Company
1600 Fortview Road
Austin, TX 78704
\$9.95

★ ★ ★ / ★ ★ ★
(see last paragraph)

BASIC Programming for the Classroom Teacher
Joan M. Miller, Ruth King Chaya, and Debra J. Santora
Teachers College Press
1234 Amsterdam Ave.
New York, NY 10027
\$15.95

by Mary Gasiorowski

These new books for beginners address two different audiences: children and teachers. They are not self-teaching books. Their emphasis is on programming, and they provide only one part of a complete training in computer literacy.

You could easily use these books in an elementary or middle school class for computer programming. *Computer Programming* offers basic training for kids, and *BASIC Programming* prepares the teachers.

Computer Programming

Computer Programming is designed for home use; it's a good resource for the whole family, and especially for children. It is printed in large, easy-to-read type.

In general, the book progresses from easy to more complex material. *Computer Programming* explains computer

components (keyboard, CPU, ROM, RAM, screen), some special keys (enter, shift, clear, left arrow, break), and gets right into programming and graphics.

Computer Programming also has some exercises designed as classroom lessons. It gives you a program to try, usually asks a question about the result, and often encourages you to experiment further.

This is not a true self-teaching book. Adults should go over the material with children. For example, the instructions to turn on the computer are technical and perhaps scary—multiple pages of large type with very few pictures to depict what is happening.

Computer Programming implies many concepts without fully explaining them. It explains that a computer has two types of memory, RAM and ROM, but not why. More diagrams would help clarify the coordinate system for graphics.

This book has lots of examples illustrating some of the finer points of programming. It occasionally requires that the student draw or write the result of the program example. This reinforces comprehension, but the book, or the adult working with the student, needs to do this much more often.

Computer Programming has many good points: It's easy to read and laid out well. It's interesting and fun, and it teaches elementary programming. You should read it in front of a computer, where you can try the examples.

And you shouldn't read the book alone. In fact, the author suggests you read it "with a friend," preferably an adult who can answer questions and offer suggestions on programming problems.

BASIC Programming

BASIC Programming is written by teachers for teachers. In a nontechnical way, it explains Basic commands and

"THE RESULTS ARE IMPRESSIVE..."

— Dennis Kitz, 80 Microcomputing, 12/82

Langley-St. Clair's* Soft-View™ Replacement CRT's eliminates the strobe, flicker and fatigue from TRS-80's.

Now you can upgrade your monitor with the new medium persistence green or amber phosphor tube.

State-of-the-art systems such as IBM™ and Apple-III™ do not use the less costly "P4" B&W display tube because it is actually intended for TV viewing and its rapid strobes (60 times per second) cause irritating eye fatigue.

No amount of "green plastic" will solve this problem. But the new **Soft-View** CRT display tube from Langley-St. Clair will.

- Available in slow-decay Green or medium decay "European Amber" (the standard in Europe).
- Made with Lead/Strontium impregnated glass that stops X-ray emission.
- Of high-contrast face glass that also stops most U.V. radiation.
- Available in frosted glass with extra Anti-Glare benefits.
- Easily installed...comes with pre-mounted hardware.
- Warranted for one full year against manufacturing defects or tube failure.
- The finest quality double-dark glass phosphor fields to produce dramatic contrast.
- Ideal for Word Processing and Programming, yet fast enough for Games and Graphics.

LSIS Soft-View™ CRTs

L-10142 Green Phosphor	\$19.95
L-10242 Green Phosphor w/ Anti-Glare	\$20.95
L-10342 Amber Phosphor	\$20.95
L-10442 Amber Phosphor w/ Anti-Glare	\$21.95
(plus shipping)	
L-10240 Red Phosphor w/ Anti-Glare	\$19.95
L-10340 Blue Phosphor w/ Anti-Glare	\$19.95

Plus \$7.00 for packing and UPS Shipping
\$12.00 for Overnight, Insured Post or UPS Blue Label
Add Sales Tax where applicable
(Inquire about the CRT's available in the U.S.A. for many other computer models.)

For MasterCard and Visa Orders only, call
800/221-7070 (in N.Y. call
212/233-6376)

Langley-St. Clair Instrumentation Systems, Inc.
132 West 24th St., New York, NY 10011



Actual unretouched photo

*World's largest supplier of upgraded replacement CRT's

Soft-View, IBM, Apple and TRS-80 are trademarks of LSIS, IBM, Apple Computer and Tandy Corp.

REVIEWS



THE GREATEST SOFTWARE DEAL ON EARTH!

Do tricks with your computer without breaking your wallet's spirit! A subscription to **Chromasette** gets you a tape or disk full of quality programs delivered by First Class Mail every month! Write for more information or, better yet, try a Back Issue. At \$6.00 for 6 to 8 programs on tape (\$11.00 on disk), you'll see just how good and inexpensive **Chromasette** software is.

The Bottom Line:	Tape	Disk
1 year (12 issues)	\$50.00	\$95.00
6 months (6 issues)	\$30.00	\$55.00
Single Issues	\$6.00	\$11.00

Calif residents add 6% to single issues. First Class postage to N Amer included. Overseas add \$10 to subscriptions and \$1 to single issues. Send AD rate. All back issues from July 1981 available—ask for list. Programs are for the Extended BASIC model and occasionally for disks.



Chromasette
P.O. Box 1087 Santa Barbara, CA 93102
(805) 963-1066

✓ 103

writing programs. It provides nonmath examples, so it's a good book for teachers in all disciplines.

The material in this book is derived from the authors' experiences giving in-service teacher workshops. It is designed for such workshops, rather than for at-home reading.

BASIC Programming accompanies the TRS-80, Apple, and Commodore PET computer systems with information and examples for all three. It is not intended to replace the manuals that come with the systems, however.

BASIC Programming introduces a command, gives an explanation and examples, and offers exercises to develop a clear concept of the command. It also provides answers to all the exercises, a glossary, a bibliography, and an extensive index. In addition, the authors have suggestions for using programming in the classroom.

The authors provide good descriptions of the various Basic commands, especially some of the more difficult concepts such as RND, ON-GOSUB and MID\$. The examples are better than average. The exercises are thought provoking, and you should work them out at a computer.

In fact, you should study the whole book at the computer. Many of the examples don't show the result of the program, so if you have no computer available and you're not familiar with the result of the commands, you might find the discussions following the examples obscure.

The later chapters introduce some fairly complex programs. One chapter details a program to test for parts of speech in a language-arts lesson. Another chapter sets up a phonics quiz.

New commands and concepts are introduced in the last four chapters, but the exercises at the end of each chapter do not start simple and gradually become more difficult; they are all fairly complex. This could be a problem for

beginners who need straightforward exercises to better understand a new command.

If you are a beginner and must choose only one book to read, this might not be the best one. For a real beginner, the comment in the first chapter, "your instructor, or the manual will . . ." is not very helpful.

References to the enter/return key imply that one such key exists. Those who have used a variety of microcomputers know that some label the carriage-return key "enter" and others call it "return," but this might be confusing to a beginner.

Another confusing aspect of **BASIC Programming** is the authors' desire to provide information for several brands of computers. Some Basic commands are different from computer to computer.

If a school has several different types of computers, it's great to find information applicable to each in one book. But if your school has only one type of computer, perhaps you should look for a book for beginners based on your computer.

In the preface, the authors express the hope that this book will help in-service and pre-service training for teaching effective classroom computer use. That is the best use for **BASIC Programming**. An experienced and knowledgeable instructor would talk through the material, answer questions, and provide more examples.

BASIC Programming for the Classroom Teacher is a quality reference and instruction book. It's a good book for a school to have, a better book for several teachers to work on together, and a very good book for teacher in-service training.

I give **BASIC Programming** two ratings: three stars for general school and teacher use, and four stars for specific use in teacher-training workshops. ■

★ ★ ★ ★

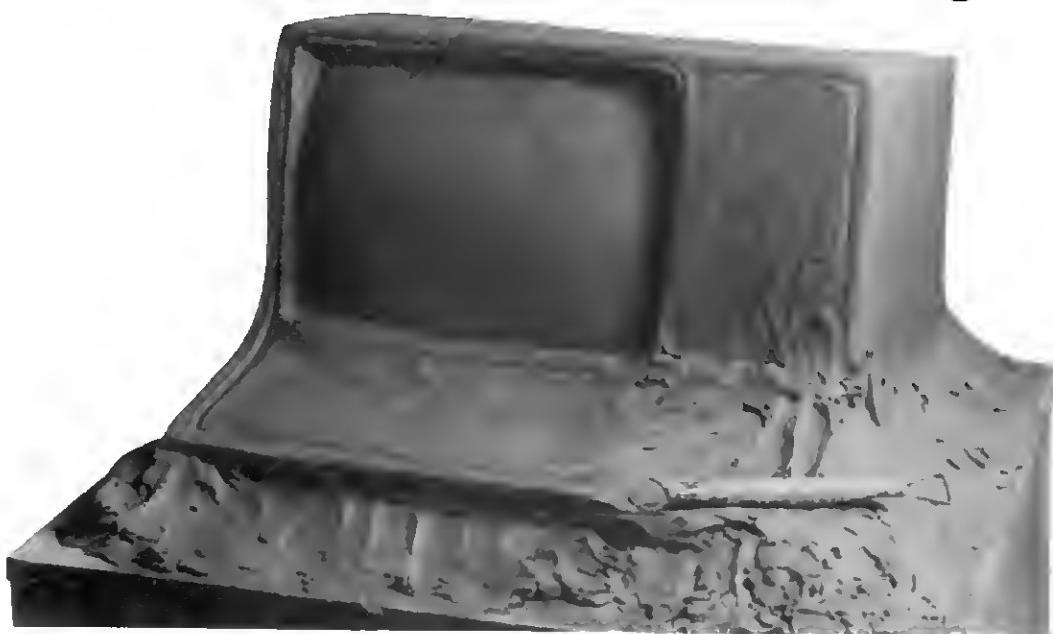
The Executive Calculator
MCS Software
809 Parkway
Conway, AR 72032
Models I and III
One disk, 48K
\$39.95

by Michael W. Ecker

The Executive Calculator is a collection of over 150 business- and consumer-oriented programs.

A calculator could handle many of the smaller programs included here, and someone with a strong background in elementary mathematics and program-

Shape your TRS-80 to communicate with any computer you want.



Omniterm is the most flexible, powerful terminal program you can buy. Omniterm lets you adapt your TRS-80 to communicate with 99.9% of the world's computers. Your company's mainframe, for example. Or any other personal computer, time-sharing computer, or communications service.

Omniterm overcomes incompatibilities in screen formats, baud rates, character sets, control codes and file transfer protocols. Seven complete translation tables let you change any character, for complete compatibility of all input and output devices. Omniterm is so flexible, users have even set up their ASCII-coded systems to communicate with EBCDIC-coded systems.

You can send all ASCII characters, even those that aren't on your keyboard. Reformat your screen to neatly accommodate any line length. Run your printer while you're sending or receiving data. And even review data that's scrolled off the top of the screen.

Omniterm's well-thought-out design makes it easy to use. You can get a status display of all functions while on line to tell you what's going on, and make any changes at the same time. You can create a special file of your settings to make it easier next time. You also get X/Y cursor control, single keystroke sign-on and auto-dialing. Even a phone directory. And lots more.

You don't have to be a computer expert to use Omniterm. Just spend a day with what the reviewers call "the best manual in the business." Then if you need help, just call, write, or contact us via CompuServe, Delphi, or Source.

Omniterm is the proven terminal program. The program thousands of people have used successfully. And the one the editors call the "top program available" (Byte, 80-Micro, Infoworld, etc.)

Omniterm comes complete with sample setting files, conversion utilities, a practical text editor, seven translation tables, and a 76-page manual with index.

Available at leading dealers, or prompt shipment on direct phone and mail orders. Order Omniterm, for a super-smart TRS-80 that's putty in your hands.

- Only \$95 for TRS-80 Models I, III or 4 (32K memory, one disk minimum). \$175 for Models II, 12 or 16 (64K memory minimum). (In Mass., add 5% sales tax.) MasterCard, VISA, and C.O.D.
- IBM PC version coming soon.
- DEALER INQUIRIES INVITED.
- Telephone: (617) 852-0233
- CompuServe: 70310,267
- Source: TCA818
- Delphi: Lindbergh



Omniterm *lindbergh Systems*

49 Beechmont St., Worcester, MA 01609

NOW Version 1.60 with auto-dial
and log-on direct from DOS!
Plus other new features.

✓135

REVIEWS

and hold keys are not disabled.

Skydiver

From your block-figure airplane, you eject the skydiver by pressing the space bar. Open his parachute the same way. The object is to land on target. You set plane speed, wind speed, and target area.

The plane always travels horizontally, but its altitude varies with each run. When the chute opens, wind speed affects the diver's lateral movement. At high wind speeds, wraparound is disconcerting since it might take the diver through two complete passes of the screen.

If your diver plummets to earth with his chute unopened, a reasonable representation of a helicopter rescues him, the game ends, and you are unceremoniously dumped to the Basic ready prompt. Otherwise, entering new parameters or pressing the enter key to retain the same limits restarts the game.

A few random catastrophes (e.g., a chute failing to open) are thrown in for good measure. With the plane at its highest speed and a maximum wind velocity, an illegal function call appears on some runs. This doesn't impair the game at other settings.

The remaining games require a bit more digital dexterity in using the space bar and the enter key. The last three games add the greater than (>) and less than (<) signs and repeat key for sideways movement. The slow response time when you repeatedly press a key is frustrating. Background graphics do not vary during any game.

Star Battle

In Star Battle, you're a fighter pilot protecting a base unimaginatively represented by a plus sign (+) at center screen. You can fire lasers horizontally along the center row as various enemies fly up to and then across that row to attack the base.

Your limited number of annihilator bombs (triggered by the enter key) let you eliminate attackers anywhere on the screen, especially from below where your lasers aren't effective. Star-studded galaxies roll up the screen between attacking waves, a nice touch.

An error terminates the game prematurely at some higher levels of difficulty.

The Wall

The Wall descends on your spaceship as you try to blast holes through to a

stationary enemy space station. You lose if the wall squashes you, if you blast an embedded mine, or if one of two types of randomly appearing flying juggernauts clobbers you.

Your approach speed increases with each successive pass of The Wall, and later stages include horizontal as well as vertical movement.

Space Swarm

Ten differently shaped antagonists chase you in Space Swarm. Some are capable of diagonal movement and others are armed with a series of line-segment energy rays. All the games give points for destroyed aliens, but Swarm offers intriguing varieties and requires quicker reactions than the previous games.

If you fire at an attacker but his missile reaches you first, you lose. You don't get credit for zapping the enemy. You'll probably find Swarm the most challenging and fascinating of the five games.

Mayhem

Mayhem pits your single missile silo against a lone bomber in one variation, or four types of destructive mechanisms in the other. They're out to obliterate four cities whose names you enter.

A direct hit on a city produces a small mushroom cloud, but when your missile silo blows or you lose all your cities, the nuclear blast fills most of the screen. The scoring mechanism appears to have a bug; it rolls back to zero on several occasions.

Mayhem is the only game in which you can fire missiles at angles other than vertical.

I wouldn't put TRSDOS and Basic on the distribution disk, or run the distribution disk in your second drive as described in the manual. Instead, I suggest making the usual back-up copies since the disk isn't protected.

The games don't contain explanation frames, so read the adequate instructions before embarking on your adventures.

The games are all variations on tried and true themes. After all, the Model II character generator is not intended for detailed graphics, and Basic puts a damper on speed. Presumably, Maryland will rectify the problems by the time this review is published.

If you must have games for your Model II in spite of its infirmities, the disk from Maryland Games is not exorbitantly priced, the games are quickly and easily learned, and they'll keep game addicts occupied. ■

★ ★ ½

The Genie in the Computer

Rachel Kohl, Laura Karp, Ethan Signer

John Wiley & Sons

New York, NY

\$12.95

by Richard Ramella

The idea behind *The Genie in the Computer* is learning TRS-80 Level II Basic through graphics. And the graphics, though simple, give quick results that illustrate simple programming techniques for the neophyte computer user.

The genie of the title is a graphics face that begins as a few X's on the screen, but becomes more complex as the book progresses. The genie transforms into various guises and activities as the reader's programming capabilities become more sophisticated.

This book is a good idea. Standard

texts that come with computers often fail to explain all the unit's capabilities. This book contains a lot of mildly interesting ideas and a few examples that will enlighten you. However, do not expect sophisticated graphics.

Chapter One sets the book's tone by presenting the genie's first face: two X's for eyes and three for a mouth. This elementary drawing explains line sequence in Basic.

The chapters continue to add other simple facial features in a kind of typewriter art on the screen. This is effective because the authors patiently explain the purpose of each line in the short programs.

Genie will help any beginner, and even barely literate children, start computing. Kids will probably forego the detailed instructions and simply type in the painlessly short programs. Even this is a useful introduction to Basic programming. ■



"EVERYTHING FOR YOUR COMPUTER"

Creative Computer

Department 80
(305) 894-0789 (Florida)

1236 E. Colonial Drive
Orlando, FL 32803 USA

TOLL FREE 800-327-9294
RIBBONS

PRINTER	RIBBONS	CARTRIDGES
	EZ RELOAD	
RADIO SHACK PRINTERS		
Daisy Wheel II	10 For \$24.95	3 for \$29.95 Re-Loadable
Black		6 for \$29.95 (DW II only) Non-Reloadable N/A
Brown/Blue/Red	6 For 24.95	
LP 1-2-4	4 For 18.95	
LP 3 & 5	3 For 13.95	
LP 6 & 8 (OMP 400)	3 For 13.95	
OMP 200	3 For 13.95	
OMP 500	3 For 13.95	
EPSON/IBM		EPSON BRAND
MX-70/80/80/F/T	3 For 16.95	16.95 ea.
MX-100	3 For 18.95	21.95 ea.
OKIDATA		
80-82-83		4 For 13.95
CENTRONICS		
700/730/737/739/779	4 For \$18.95	
ZIP PAK		
CITOH	3 For \$13.95	> 190

CALL TOLL FREE 800-327-9294

Write For Free Catalog

Over 1000 items in Diskettes, Paper, Labels, Ribbons, Checks, Storage Boxes, Furniture, Binders and Hardware. Florida plus 5% tax.

Add \$2 For Shipping On Orders Less Than \$30

Most orders out in 24 hours with VISA, M/C, Money Order, AMEX, Cashier Check, Bank Wire and C.O.D. Personal check allow 10-14 days. Mail order only. Prices subject to change.

MASTER ELECTRONICS, INC.

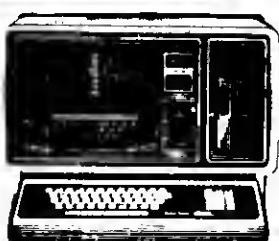
*TRS-80 is a trademark of Tandy

CAN SET YOU UP IN A

TRS-80

STATE-OF-THE-ART-COMPUTER

STARTING AT 15% DISCOUNT!



FULLY STOCKED
IN: Model II's
Model III's
ALL- PRINTERS
AND — MORE!!
* PLUS *
THE ALL NEW:

Model 16 and the 12.5 meg. Hard Drive!

CALL US NOW!!!

Toll FREE: 1-800-531-7323

TEXAS CALL COLLECT 512/689-5536

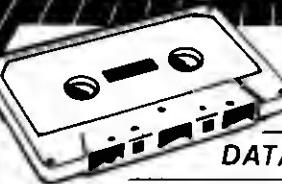
MASTER ELECTRONICS, INC.
228 SOUTH 7th STREET
RAYMONDVILLE, TX 78580



146

YORK 10TM

CASSETTES DISKETTES



- LOWER PRICES
- LONGER LENGTHS

DATA TRAC C-06, C-12, C-24

From the leading supplier of Computer Grade Cassettes, new, longer length C-12's (6 minutes per side) provide the extra few feet needed for some 16K programs.

Premium 5-screw shell with leader
— BASF tape

Internationally acclaimed.
Thousands of repeat users.

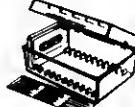
Error Free • Money back Guarantee

SPECIAL 500 C-12's 38¢ each

Shipping \$17.00/500

w/labels add 4¢ w/boxes add 15¢

CASSETTE STORAGE CADDY



Holds 12 cassettes w/o boxes
Includes edge labels and Index card



TRACTOR FEED
• DIE-CUT BLANK
CASSETTE LABELS

BASF Qualimetric Flexi-Disc—Lifetime Warranty.
5 1/4" Single Side, Double Density, Soft-Sectorized.

NEW! MICRO CASSETTES in convenient short lengths.
MC-10 | Same superior tape in premium shell
MC-20 | WITH LEADERS. Supplied complete with 156
MC-30 | box (fits Epson & Sharp micro drives)

Call: 213/710-1430 for IMMEDIATE SHIPMENT
on Credit Card Orders

ORDER MAIL TO: **YORK 10TM** Computerware
NOW... 24573 Kittridge St., #80 Canoga Park, CA 91307

— ORDER FORM —

ITEM	1 DOZEN	2 DOZEN	TOTAL
C-06	<input type="checkbox"/> 7.00	<input type="checkbox"/> 13.00	
C-12	<input type="checkbox"/> 7.50	<input type="checkbox"/> 14.00	
C-24	<input type="checkbox"/> 9.00	<input type="checkbox"/> 17.00	
Hard Box	<input type="checkbox"/> 2.50	<input type="checkbox"/> 4.00	
Blank labels	<input type="checkbox"/> 3.00/100	<input type="checkbox"/> 20.00/1000	
Storage Caddy @ \$2.95 ea. Qty _____			
Flexi-Disc	<input type="checkbox"/> 26.95/10	<input type="checkbox"/> 20.00/50	
MICRO CASS. 1 DOZEN	2 DOZEN		
MC-10	<input type="checkbox"/> 16.50	<input type="checkbox"/> 32.50	
MC-20	<input type="checkbox"/> 18.00	<input type="checkbox"/> 34.50	
MC-30	<input type="checkbox"/> 19.00	<input type="checkbox"/> 36.00	
SUB TOTAL			
Calif. residents add sales tax			
SHIPPING/HANDLING (any quant., except for Special)			3.50
Outside 48 Continental States—Additional \$1 per caddy; per doz. cassettes or boxes; per 10 discs			
TOTAL			

Check or M.O. Charge to
enclosed Credit Card VISA MASTERCARD
 PLEASE SEND QUANTITY DISCOUNTS

#80

Card No. _____ Exp. _____

Name _____

Address _____

City _____ State/Zip _____

Signature _____ Phone _____

Computer make & model _____ Disk? (y/n) _____

Each std cassette includes two YORK 10 labels only. Boxes are sold separately. We prefer to ship by UPS as being the fastest and safest! If you need shipment by Parcel Post, check here

NOTE Additional charges outside 48 Continental States. Shipments to AK, HI, and USA possessions go by Priority Mail. Canada & Mexico—Airmail. All others—Sea Mail

REVIEWS

ming techniques could write them. However, the total package is impressive and covers a wide variety of financial questions.

The Executive Calculator performs the types of calculations listed in the main menu: pricing and profit, interest calculations, depreciation techniques, real estate formulas, lease calculations, graphs and charts, personal loans, financial decision making, equivalents and conversions, and miscellaneous calculations.

The Model I version comes on cassette. You have to transfer the nearly one dozen modules to disk. The Model III version is already on disk.

The programs themselves, although nominally in Basic, are invisible. You can display them from your directory only by specifying invisible files (use DIR (INV) or DIR (SYS, INV)). Consequently, they're difficult to modify.

The manual is an 85-page user's guide on saddle-stitched, colored paper. It is fairly well done, has few errors, is easy to read, and comes with program examples. In general, the programs are so straightforward I didn't have to consult the manual.

The loading instructions are simple, although you invoke an unusual Copy routine to reproduce the Model III disk on one of your system disks. The directions show you a permanent patch to TRSDOS that bypasses the initial date and time prompts and automatically loads The Executive Calculator.

Program Format

The programs are arranged in a main menu with submenus for each entry. The user's guide illustrates each of these, so you should first read the manual to avoid confusion.

You must select one of the main menu entries to access a submenu. After each calculation, the program prompts "Enter 'A' for Again, 'X' to return to Main Menu...?" This is a nice feature that eases program use. I found that you can also figure another calculation by hitting the enter key.

Speaking of shortcuts, an INKEY\$ routine, instead of the Executive Calculator Input routine, would allow quicker, one-key responses to program prompts.

Calculations

I found most of the programs to be mathematically accurate. The loan



amortization program produces exactly the same results as one I wrote. The same is true of the interest calculations. I don't think that anyone need worry about The Executive Calculator producing incorrect values.

However, the vagaries of binary and single-precision arithmetic do produce some unsettling program results. In the yards-to-miles conversion, entering 1,760 yards produces .99968 miles. In fact, 1,760 yards is exactly one mile. This type of error is unfortunate because the five decimal places suggest accuracy to that level.

The manual contains a summary sheet of the various utilities under the main menu headlines. It's fairly impressive, although I thought some of the calculations were a little too trivial to include.

The conversion module and some of the miscellaneous calculations are not much more than multiplication or division, as in converting square feet to

square inches. Many also abbreviate to the point of imprecision: Square inches appear as inches, for example.

Some of the miscellaneous calculations are also trivial: finding a square root, finding a tangent, multiplication, and division. However, some useful utilities appear in this same module: the number of days between two dates, or the day of the week a given date falls on.

The program does have other shortcomings, but MCS Software is planning corrections for some of them. For instance, I'd like to do further calculations of one type by hitting the enter key in response to a prompt.

In the loan amortization program, I'd like to see a way to change only the interest rate for comparison purposes. Along these lines, The Executive Calculator contains a terminology error: The correct term for the actual yearly interest rate is effective annual rate, not nominal rate.

Another problem is that the section on graphs always starts off with a bar graph, even when you choose a line graph. Since it's possible to toggle back and forth between them, this is mostly an inconvenience.

Evaluation

In spite of my specific criticisms, I feel that this is a useful collection for the average business user. Some of the programs include sound and graphics, and you get a lot of solid financial programs for the money.

The value of these small utilities is their number and their presence in one package. Comparable packages could easily cost twice this much. If MCS attends to the minor difficulties, what is now an excellent buy will become even better. ■

★ ★

Maryland Model II Games (Volume 1)
3304 Carlton Ave.
Temple Hills, MD 20748
\$29.95

by Charles R. Perelman

Maryland Model II Games provides five games in Radio Shack Basic. Given the Model II's limited resolution, black and white CRT, and graphics

character set, you can't expect Pac-Man. All things considered, this is a credible group of games.

Skydiver, Star Battle, The Wall, Space Swarm, and Mayhem are in order of increasing complexity. You can adjust input factors to vary the difficulty of each game.

Object definition is coarse, with small symbolic representations for various types of space attackers, weapons, or ships. Movement is limited and much slower than the usual arcade games. Response time is also slow. The break



New Release

Now supports Mailing Lists, Form Letters, "ZAP-PROCESSING", and 18 more printer drivers.

ZORLOF II

STILL ONLY \$69.95

IF YOU STILL THINK YOU HAVE TO SPEND \$200 FOR A GREAT WORD PROCESSING SYSTEM, THEN YOU NEED TO READ THIS AD!!

The Magnificent WORD PROCESSING SYSTEM

For the TRS-80 Model I and III

- Supports over 50 different popular printers including OKIDATA Microline 80, 82A, 83A, 84A, Oume, Centronics 737, 739, Radio Shack Line Printer IV, VI, Daisy Wheel II, EPSON MX-80, MX-100, Graftrax, Graftrax Plus, Gemini-10, Gemini-15, NEC PC-8023A-C, Spinwriter 5510, 5515, 5520, 5525, C. Itoh Prowriter 8510, Starwriter FP-1500, F-10, Tec 8500R, Smith-Corona TP-1, Brother HR-1, COMREX Com-Riter CR-1, IDS Micropism 480, and Diablo 630.
- Supports proportional space right-margin justifying on Centronics 737, 739, Radio Shack Line Printer IV, Daisy Wheel II, Graftrax Plus, NEC PC-8023A-C, Spinwriter 5510, 5515, 5520, 5525, C. Itoh Prowriter 8510, Starwriter FP-1500, F-10, and Diablo 630.
- Powerful Mailing List and Mail-Merge capabilities for personalizing standard legal documents and Form Letters, handling infinite number of data records per run, infinite number of data fields per data record, and data fields as large as up to 1000 characters each.
- Brand new feature called "ZAP-PROCESSING", allows you to display and edit any type of data or program file in "ZAP" (byte-hexadecimal) format.
- Any character or symbol your printer can print, even dot graphics, can be used in mid-line printing with the Special Character feature.
- Written in fast Z80 machine language with type-ahead key-stroke buffering for speed typing.
- Single key-stroke control of all editing functions for ease of use.
- Continuous on-screen display of word count, line count, and free memory count.
- Superscripts, subscripts, underlined, bolded, expanded and condensed type styles - combine and intermix within a line.
- Automatically justifies and word-wraps on the screen as you type.
- Search, Replace, and Global Search and Replace.
- Odd and even page user-definable headers, footers, and page number lines, with automatic page numbering.
- User-definable linespacing, sheet size, top, bottom, left, and right margins.
- Move blocks of text and copy blocks of text from disk, to disk, and within the text.
- Examine disk directory on any disk and kill files while editing.
- Powerful full-screen editing features for EDTASM and BASIC files, including automatic renumbering of lines.
- Built in function to dump contents of screen to printer.
- Print-previewing formats text, inserts headers, automatically numbers pages, etc. on the screen without printing it on paper.
- Page by page pausing capability for sheet fed printers.
- Supports both parallel and serial printers.
- Printer control code access.
- Works with NEWDOS, NEWDOS80, TRSDOS, MULTIDOS, LDOS, and DOSPLUS - Single or Double Density.
- Compatible with most all available spelling checker programs.

GUARANTEE

Many word processing systems claim theirs are the best, but few would dare guarantee them. Not us! We are confident that ZORLOF is the most useful word processing system on the market for under \$200. If you don't agree, return it within 30 days for a full refund.

Add \$2.00 shipping & handling. Florida residents add 5% sales tax. Checks require 3 weeks to clear banks.

v141

ANITEK

SEE YOUR LOCAL
DEALER OR CALL (305) 259-9397



ANITEK SOFTWARE PRODUCTS □ P.O. BOX 1136 □ MELBOURNE, FL. 32935 □ (305)259-9397

★★★

Maxi Stat
The Business Division
Box 3435
Longwood, FL 32750
Model I and III, 48K
Two disk drives, printer
\$199.95

by John B. Harrell, III

Maxi Stat is a comprehensive statistics package and a valuable ad-

dition to the library of anyone who analyzes data. It is a full and powerful system that provides functions normally available only on mainframe computers.

You don't need to be a programmer to use Maxi Stat. But it's not a package for the casual user, and you need to know something about statistics.

Maxi Stat provides many analytical functions, including custom programming interface, write subfile, frequency distribution, descriptive statistics, cross-

tabs and chi-square analysis, correlation and linear regression, t-test for matched pairs or independent groups, multiple linear regression, analysis of variance, and multiple variable response.

The write subfile option is not a true analytical function. It allows selection of a subset of data from one file and, possibly, recoding the data and writing it to another file. You can then use this subfile as further input to Maxi Stat.

To perform any statistical analysis using Maxi Stat, you must use the vari-

at Games Glance

Gauntlet, Computer Shack, 1691 Eason, Pontiac, MI 48054, Models I and III, \$19.95 cassette, \$24.95 disk.

by Mary E. Ruth

Gauntlet is another tank game for the Models I and III. The game begins by informing you that aliens have landed in San Francisco—the opening sequence includes the alien spaceship hovering over the Golden Gate Bridge.

You battle the creatures within a 9- by 6-square matrix of city blocks. You have three tanks—use the arrow keys to traverse city streets and avoid aliens, then fire at them using the space bar.

You score 60, 70, 80, or 90 points for each alien, depending upon the type killed. When you kill an alien, another takes its place. For every 10,000 points you score, you receive a new tank. At least that's what the documentation says—I wouldn't know.

The game manual is serviceable if unimpressive. It mentions "terrific sounds"—after two or three games, the death-march tunes become annoying.

The game is difficult at first, and it doesn't get any easier. ■

Dig Out, Computer Shack, 1691 Eason, Pontiac, MI 48054, Models I

and III, \$19.95 cassette, \$24.95 disk.

by Mary E. Ruth

Dig Out, a Dig Dug play-alike, puts you at the controls of an underground rover who burrows tunnels and dodges monsters through 15 subterranean levels. Use the arrow keys to maneuver your rover through existing tunnels or create your own passageways as you go.

You begin the game with four rovers; you get another for every 10,000 points you score. Firing the space bar repeatedly at close range kills the enemy beasts roaming the tunnels; you score 500 points for each one killed.

Two rocks sit on each screen; touching one means certain death. For every monster the rock kills, you score 1,000 points.

The monsters travel through tunnels in any direction. In the absence of tunnels, they burrow up to the top of the screen. Don't position yourself directly below one of them; they drop deadly eggs.

As you progress through the different levels, their speed and resourcefulness increase. You advance to another level only when you kill all the monsters in your present level.

The game comes in a brightly (although not cleverly) designed package. The documentation is adequate

but riddled with misspelled words. The game's sounds seem appropriate at first, but quickly turn into a tiresome drone.

But Dig Out is still fun and challenging. ■

Weerd, Big Five Software, P.O. Box 9078-185, Van Nuys, CA 91409, Models I and III, \$19.95.

by Ronnie Brown

Weerd is a refreshing change of pace from run-of-the-mill computer games. Forget about energizers, disruptoids, and blue meanies. Just watch out for all those nameless critters that flit, skitter, and swoop around your screen.

Your mission is to defend a planet from all sorts of alien craft. Your shots must hit an invader or reach the top of the screen before you can fire another volley.

You have three ships and three sets of energy shields for each round. Shields last for six seconds and protect against all alien bombs, eggs, and debris, but not against kamikaze ships.

If you're tired of playing computer simulations and serious arcade games, try Weerd. ■

Introducing SooperSpooler's™ Little Brother

Who knows spoolers better than Consolink?* We pioneered this industry with our revolutionary SooperSpooler, the Intelligent Printer Interface.

Now meet the newest family addition:

MicroSpooler™

especially designed and engineered for those who need cost-effective solutions to their spooler requirements without sacrificing quality and sophistication.

No More Waiting on the Printer

The new MicroSpooler stores data and then feeds it to a printer as fast as the printer can handle it.

That means no down time: in a matter of seconds, your computer is free for the next job **without waiting** for the printer to finish the last job.

Quality, Reliability, Flexibility

As with the SooperSpooler, the new MicroSpoolers are the product of the highest engineering standards to insure trouble-free operation. Now Consolink offers a complete line of stand-alone spoolers that can be installed in-line between virtually any printer and any computer.

Easy to install. Easy to use. Easy on the budget.

Features include:

- 16K Memory: User or factory expandable to 32K or 64K
- Multiple Copy Function
- Status Readout: Tells you how much data is stored or how many copies are left to run
- Pause Function: To let you change paper, make adjustments
- Self-Test Routine: Performs a comprehensive check of most internal functions and memory
- Internal Power Supply: No bulky plug adapters
- Vertical Mount Configuration: Saves desktop space
- Plug-in connections to most computer combinations

- Independently Selectable Baud Rates on Serial Ports
- One Year Limited Warranty**
- Thirty-Day Money Back Guarantee**
- Four Models: Any Combination of Parallel or Serial I/O
- \$199 for 16K parallel to parallel unit with an internal power supply

And When You Need the Very Best...

Remember SooperSpooler, the Intelligent Printer Interface with a remarkable range of software controlled features and formatting capabilities.

See our new MicroSpoolers at quality dealers everywhere. For immediate answers to your questions, call Toll Free **800-525-6705**.

**Spoolers by Consolink—
Now you have an Intelligent
Choice.**

CONSOLINK
CORPORATION



Without MicroSpooler

21 Minutes

CPU time for 20 pages†
80 CPS Bidirectional

✓ 405

With MicroSpooler

16 Seconds

CPU time for 20 pages†

For immediate answers to your questions, call Toll Free: **800-525-6705**
Consolink Corporation, 1840 Industrial Circle, Dept. MLI-203 Longmont, CO 80501 (303) 652-2014

*Formerly Compulink Corporation

**Consult your dealer or Consolink for details

†60 lines per page, random line lengths, 40 char/line.

Assumes CPU can output text at a minimum of 3000 char/sec.

ous phases of the system to create codebook, data files, and control files. The Maxi Stat task execution system uses a set of these three files to perform the required analysis.

Codebook Management Phase

The codebook is the format description of the data file that the program's analysis section uses. You can enter data in the fixed or free format modes. This allows a wide variety of input formats, including output from most other programs that write an ASCII output file.

You can even edit files using most of the popular text editors. Data record size is limited to 255 characters in the fixed mode and 127 characters in the free-format mode.

Begin the format control entries of the codebook by specifying the number of variables. A variable can be any type of data (an X-ordinate value, an answer to a question, and so on) and can be in numerical or alphanumeric format.

Each variable has a label of up to 40 characters. Maxi Stat uses the label to refer to this variable in any further input or output concerning it.

In the fixed-format mode, you then specify the starting column for the data and the number of columns required for the data field. As part of each variable, Maxi Stat allows the assignment of val-

ue labels to the expected responses.

Figure 1 shows a typical codebook entry. The example contains two variables. The first is the respondent's age in years. You enter it in fixed numeric format beginning in column one and taking two columns.

The second variable is the respondent's candy preference. You enter it in

Fixed	(specifies the file format type)
Respondent's Age (in years)	(variable #1 name used by Maxi Stat)
1	(starting column number)
2	(number of columns used)
N	(specifies numeric type field)
@	(end of variable #1 description)
Respondent's Candy Preference	(variable #2 name)
3	(starting column number for fixed format)
1	(number of columns used)
A	(specifies alphanumeric type)
A = Snickers	(these three)
B = 3 Musketeers	(items specify)
C = No Preference	(the preferences)
@	(end of variable #2 description)

Figure 1. Codebook file format.

ORDERS CALL COLLECT
PHONE LINES OPEN 24 HOURS

VISA C.O.D. MasterCard

NAME _____

ADDRESS _____

CITY _____ ST _____ ZIP _____

PIK'EM 2995 STAT SER 3500
 MI MIII APPLE IBMPC
 VISA MC PAY ENC

CARD EXPIRES

PIK'EM

1983

A COMPLETE PRO FOOTBALL PREDICTION PROGRAM
FOR THE 1983 NFL SEASON—INCLUDING PLAY-OFFS

*20 MIN DATA INPUT PER WEEK WILL GIVE YOU
THE EDGE

\$29.95

INCLUDES: DISC DOCUMENTATION
TRS-80 MODEL I / III
IBM PC
APPLE
REQUIRES 32K

STATISTICS NEEDED TO RUN THIS
PROGRAM ARE AVAILABLE IN
LOCAL NEWSPAPERS
OR
MARATHON WILL FURNISH ALL
NECESSARY STATS IN AN EASY TO
READ ONE PAGE FORMAT FOR 19
WEEKS
STATS ONLY \$35.00

67%
ACCURATE

AGAINST POINTSPREAD
1982 SEASON
INCLUDING
AN OUTSTANDING
13 OF 15
PLAY-OFF GAMES

FEATURES

- DISPLAYS PREDICTED SCORES 219 GAMES
- DISPLAYS ACCUMULATED STATS/TEAM
- DISPLAYS AVERAGE STATS/TEAM
- HARDCOPY PRED - STATS - AVE
- AUTOMATIC OPPONENT INPUT
- AUTO STORE DATA - NO 'SAVE'
- UPDATEABLE FOR 1984

IF PROGRAM IS BOUGHT AFTER
SEASON STARTS — ALL PREVIOUS
STATS NECESSARY TO UPDATE WILL
BE INCLUDED — NO CHARGE.

OTHER PROGRAMS

- PIK'EM 1984 FOR USFL •
- HOME BUDGET PLANNER •
- LETTER WRITER •

Marathon Software Dept M
P. O. Box 1349
Jacksonville, Texas 75766
Phone (214) 586-8212 ✓ 241

IF YOU'RE GOING TO BE PICKY ABOUT AN OPERATING SYSTEM SEE WHICH WAS PICKED BEST.



The readers of 80 Micro were asked to select their favorite operating system for the TRS-80 Model I&III. LDOS, DOSPLUS, TRSDOS, MULTIDOS, WOBOS I and NEWDOS/80 were all on the ballot. They picked NEWDOS/80.

The editors of 80 Micro have also awarded their Hall of Fame Awards. From among every software package on the market, the editors picked only six that they felt made a lasting and significant contribution to the TRS-80 computer. NEWDOS/80 was one of the six.

Since we first introduced the NEWDOS operating system we've been stating its features, capabilities and advantages. Thank you 80 Micro readers and NEWDOS/80 users for supporting us.

Version 2.0 . . .

High Performance DOS

NEWDOS/80 Version 2.0 is our highest performance system yet. The versatility and sophistication of Version 2.0 includes features like:

- Double density support on the Model I

- Enhanced compatibility between Model I and III
 - Triples directory size
 - Dynamically merge in BASIC (also allows merging of non ASCII format files)
 - Selective variable clearing
 - Can display BASIC listings page by page
 - Automatic repeat function key
 - Routing for peripheral handling
 - Enhanced disassembler
 - Command chaining
 - Superzap to scan files
 - Fast sort function in BASIC
- Hard Disk Support Now Available**
- Support for Apparat's and Radio Shack's Model III hard disk (optional-available upon request for additional \$60)

These features make NEWDOS/80 one of the most powerful additions you can make to your system. And Apparat's commitment to support assures that you've purchased a superior product, both today and tomorrow. At just \$149.00 it could be the best investment you will make for your TRS-80.

For more information see your local computer store or contact Apparat, Inc., 4401 S. Tamarac Parkway, Denver, CO 80237, 303/741-1778.

TRS-80 and TRSDOS are registered trademarks of Tandy Corp., LDOS - Logical Systems, DOSPLUS - Micro Systems Software, MULTIDOS - Cosmopolitan Electronics, WOBOS I - Western Operations, NEWDOS/80 - Apparat.



Apparat, Inc.

v 40

What do people who've used the NEW amber or green replacement CRT's say about them?

"...Anyone could easily install this replacement CRT. The instructions are clear, simple (if not over simplified), and complete. At no time during the installation was I confused or lost. It even worked the first time I turned it on.

"I believe the orange (amber) phosphor is a great improvement over the standard monitor. Often I sit at my computer for several hours at a time and I can really tell the difference between the two monitors..."

"The (Langley-St.Clair Soft-View) CRT is an excellent product and makes the TRS-80 an even better computer."

Mark Renne
Review in 80 U.S.

"The instructions...are in pleasantly plain English, and I was able to install the CRT in about twenty minutes, even though I had never performed such a task before. The difference in the display is most gratifying; it has a much more 'professional' appearance, the contrast is much better, and it is definitely easier to use for sustained periods of time. The last item is particularly important, since my TRS-80 is mostly used for word processing.

"Again, thank you very much for your excellent service in providing me with a product which is everything it was advertised to be, and which makes my computer more useful...I will not hesitate to recommend your fine product and company to other TRS-80 owners."

J. Kimble Rigney
Columbus, Ohio

From unsolicited letters of testimonial.
reprinted with permission

LSIS's NEW SOFT-VIEW REPLACEMENT CRT

FOR THE
FULL STORY
SEE PAGE 43

Langley-St.Clair

Instrumentation
Systems, Inc.

132 West 29th St., NY, NY 10011
T 221-7777

REVIEWS

a fixed, alphanumeric format beginning in column three and taking one column. The letter designations listed in the codebook file specify preferences.

Figure 1 appears extremely complex, but Maxi Stat makes it easy to create a file like this with a conversational input sequence that acquires the appropriate information from the user. You never see this file format unless you need to edit the file. The documentation is explicit in its description of all the file formats.

The Codebook Management Phase lets you add to an existing codebook, edit, and print, in addition to creating the file. The editor used for this and each of the other phases is a mixture of Basic and machine-language coding.

The commands are similar to those used in Electric Pencil, making the editor a snap for those already familiar with this system. A word of caution—this is not Pencil and significant differences do exist.

Maxi Stat uses a defined field size for all input required in the various routines. The program displays the specified input field size with the appropriate number of underline characters on the video terminal prior to input and then it updates the input field as you enter each character.

This helps when composing an appropriate data title. However, using the INKEY\$ function in Basic slows the input routine considerably; a rapid typist can overtype the input routine.

Data Management Phase

The next major phase is the Data Management Phase. This is not essential to the system as you can prepare data with any other program as long as that program writes the data file to the disk in ASCII format. ASCII is the standard TRS-80 disk output mode of operation using the PRINT #n statement.

The Data Management Phase directly creates a data input file. The program prompts you for the input values of each variable in the codebook used by the creation program, and constructs the data file in a format the codebook specifies.

Once you create the codebook, this is an easy method to input data in raw form. But if you've reduced and prepared the data for computer input in accordance with the codebook format, a word processor can create the data file much faster.

The Data Management Phase also allows editing the data file and printing the raw data. The editor used is much the same as that used by the codebook manager. The most notable additions to the editor in this phase are data verification and the provisions for setting and using tabs in any video screen location.

You can use the data verification function to read any data file field and verify that each entry is within the specified bounds. This is an extremely valuable function that saves many hours of validating large raw data files.

Analysis Management Phase

The last part of Maxi Stat is the most important—the Analysis Manager. This phase allows the creation and maintenance of job control files that specify the tasks Maxi Stat performs. This allows the creation of many tasks to be saved as one file for execution as a batch system.

The functioning of the analysis manager is similar to the previous phases. The control file is created, edited, and printed as before. The most significant function of the analysis manager is execution of the analysis control file.

Figure 2 lists the contents of a typical control file. This file contains the complete list of tasks Maxi Stat performs; each task is separate and distinct from the others.

Linear Regression Test of Maxi Stat	(page heading to be used for all tasks this run)
BKEX2:I	(codebook file name specified on drive 1)
EXDAT2:I	(data file name specified on drive 1)
Graphical Representation of Data	(title of this particular task)
5	(analysis selection—linear regression)
1	(variable number on the x axis of the graph)
2	(variable number on the y axis of the graph)
@@	(end of task symbol)

Figure 2. Task control file format.

In Fig. 2, the task is set up to execute a linear regression analysis, and prints out the pertinent statistics with a rudimentary graphical representation of the data, including the linear fit that the analysis determines.

The first entry in Fig. 2 is a page heading that appears on all printed pages. Next are the specified codebook and data files for the task to be performed. The last entries are a subtitle for the task and the analysis type.

The number of the variable to be analyzed (which corresponds to the variable number in the codebook used for this analysis) follows the analysis type. In most of these options, the program lets you input a range of variables on which a particular analysis acts. This saves you from reentering the task for each variable analyzed.

The only information missing in this example is the recoding of input data for the specified analysis. One of the analysis manager's most powerful features is the ability to construct recoding directions that allow data manipulation during task execution.

For example, you specify one variable as the respondent's age, and data analysis reveals that its range is 15 to 75 years. You want to group the respondents into age brackets and analyze the data within these brackets. You can manipulate this information during task execution by entering the proper recode directives into the analysis task file.

You can perform an absolute recode, a conditional recode, and a select-if recode as part of any task. Each choice is temporary, modifying the data only as the program reads it from the input file and writes it to the temporary file during data preparation for the analysis subtask.

You can make these changes permanent by using option number one, write subfile. The new file will now contain the recoded data.

Documentation

The user's manual comes in a high quality, three-ring binder. It's divided into six chapters and an appendix, separately tabbed for easy access. A section called Statistical Notes, consisting of the formulas and concepts used by Maxi Stat, provides enough background to let an accomplished programmer modify the system.

A section called Sample Outputs enhances the user's understanding of vari-

ous Maxi Stat routines. It's not comprehensive or detailed enough for anyone but an accomplished programmer to make much use of it. Many of the examples aren't reproducible due to lack of proper input data.

In general, the manual is comprehensive and concise, if not wholly accessible to the beginner.

Pluses and Minuses

The menu-driven Maxi Stat system is easy to use. Error detection is good and prompting for error correction is clear.

System operation, particularly the input routines, is relatively slow because most of the system is written in Basic. However, Maxi Stat is responsive enough that the delay isn't annoying.

The input prompts are excellent. The program specifies each input field on the video screen by first displaying the field size using the underline character. Each input character then appears in the respective position in the field. This feature is particularly useful when you build the data file using the data management phase of Maxi Stat.

Many of Maxi Stat's features depend on the DOSPLUS 3.4 kernel on the system disks. The Getting Started section of the manual addresses how to move the programs from this system to another but does not address any system dependencies.

For example, the DIR command, which you can substitute for a file name at the appropriate prompts, works only with DOSPLUS. This is because under TRSDOS the directory has an intentional error in the Hash Index Table (HIT) sector byte for DIR/SYS that makes the directory inaccessible to the operating system, and the data address marks on the directory track cause a "TRIED TO READ LOCKED/DELETED RECORD" error.

Maxi Stat can't communicate with the operating system in Basic under the TBasic interpreter supplied with the DOSPLUS kernel, although other systems, including DOSPLUS, can. Maxi Stat compensates for this by accessing Dir/SYS under Basic program control, and formatting and displaying the directory under program control.

Numerous conflicts in disk structure exist on the Model I double density disk. These conflicts make the disk unusable if you don't own a version of the DOSPLUS operating system or LDOS. The most significant conflict is location

What do people who've used the NEW amber or green replacement CRT's say about them?

"To the President of Langley-St. Clair:

"Your entire staff merits applause."

"For three months we've been trying to get an Orange Phosphor slow-decay CRT from Tandy, with zero success, even though we've spent over \$16,000 with TRS.

"Three days after calling you, not spending a dime with you previously, we got it. Seventy-two minutes later, it was up and working fine.

"Your shipment service is terrific. Your installation guide is 100% clear with accurate step-by-step instructions and even a touch of welcome humor.

"This is the first letter produced with your CRT. After we try it for a while, we'll probably order two more for our other TRS-80 Mod IIs...from you, no one else.

"Congratulations. Your advertising is accurate."

Rene Gnam
Clearwater, Florida
From an unsolicited letter of testimonial

"I recently replaced the old black & white CRT in my (Heathkit) H89 microcomputer with one of the new Amber non-glare CRT's sold by Langley-St.Clair Instrumentation. The decrease in eye strain was quite dramatic and I highly recommend the amber tube in place of either the plain white or ghastly green that Heathkit offers..."

"I must admit there is one drawback. Since the amber tube has a non-glare surface, I can no longer see people sneaking up on me."

John Roy

*Review in
Buss Newsletter December 1982*

LSIS's NEW SOFT-VIEW
REPLACEMENT CRT

FOR THE
FULL STORY
SEE PAGE 43



Langley-St.Clair

Instrumentation
Systems, Inc.

132 West 23rd St., NY, NY 10011
1-800-221-7370

REVIEWS

of the directory on a track other than track 17, and the use of more than five sectors in one granule.

Data disks formatted in single density under DOSPLUS in other than 35-track mode have the disk directory written approximately half the distance into the disk (e.g., a 40-track disk has the directory on track 20). This causes difficulty and additional head movement in finding the directory when you use the disk with a system expecting the directory on track 17.

The Maxi Stat system places two unnecessary restrictions on the user during specification of file names. First, you must specify a drive number for each reference to a file. This is not required when the file has been previously defined. Second, the Basic input routines do not allow for any file extensions.

Maxi Stat allows the use of floating point or real data as input values. The user must be careful when using data that is not integer in value. You can only use this particular data type in the free data format and it might cause problems in print output formatting.

One annoying feature of the editor routines used to maintain the codebook, data files, and task control files is the system reboot on exit from the editor. The Basic high memory value is set on entry to the editor to protect the code's machine language portion that the Basic part of the editor loads.

After setting the word beginning at 40B1 hexadecimal (hex) to the appropriate value upon entry to the editor, the program resets this value by POKEing a Z80 HALT instruction into 402D hex (normal DOS exit point) and calling it via the USR function of Basic to exit the editor.

On the normal TRS-80, this causes a system reset, as the halt signal is tied to the reset line of the computer. This feature doesn't work on other computers, such as the LNW-80, and requires pressing the reset button to exit.

The editor is a hybrid consisting of a Basic main program with machine-language support routines. The editor's commands are almost identical to Electric Pencil and its performance is quite good.

One significant difference is the handling of insert/overwrite modes. The editor is normally in the overwrite mode of operation, meaning that text is replaced with the new text you type over it. Maxi Stat's editor automatically goes into the insert mode if you at-

tempt to extend a line and remains in the insert mode until you press the break key, the enter key, or the appropriate control key.

Another difference is that you can't exit the editor, short of resetting the computer, without rewriting the text buffer to the disk.

The DOSPLUS 3.4 kernel selected for sale with this software package doesn't have a sufficient number of commands to support full operation with this system alone. Maintenance of the Maxi Stat data disk using commonly found utilities and system functions

from other operating systems eventually forces you to move this program to another operating system.

Conclusion

The Maxi Stat system is a superior product that provides a means of complete statistical analysis without accessing the programmer levels of the computer. The system is easy to use and relatively error free.

You would have to make a substantial programming effort to duplicate the program's many functions. Maxi Stat is well worth its price. ■

★ ★ ★

The Home Accountant
Continental Software
11223 South Hindry Ave.
Los Angeles, CA 90045
Model III, 48K
Two disk drives, printer recommended
\$74.95

by Timothy Daniel

Quick! Without looking, how much money is in your wallet? If your guess is accurate, you're a good candidate for Continental Software's Home Accountant. You don't have to be rich to use it. But you have to care about your money and where it goes to appreciate this package.

At first glance, Home Accountant is just another checkbook program. But if you dig deeper, you'll find a checkbook program gone wild.

You can use up to 99 budget categories, incorporate automatic depreciation or appreciation, search for individual transactions, print checks, generate graphs, print financial statements, and, yes, even balance your checkbook.

Here's what you need to get started: a Model III with at least 48K RAM and TRSDOS 1.3, two disk drives, and a printer, preferably one that can handle 132-column printouts.

The multilevel menu format lets you select the options you want. You can start by trying to balance your checkbook. It's a bit like hauling trash in a Cadillac, but when you're ready to upgrade, the capability is there.

At the Core

The nucleus of Home Accountant is

its budget module. You only have two budget categories in the simplest application, one for your checking account balance and the other for cash. The 99 budget categories are divided among expenses, income, assets, and liabilities.

Each category contains two values. The first is a current balance, reflecting the transactions entered to date. The second is assigned by you and is the amount you've budgeted for that category. While budget values aren't required, they can help, since Home Accountant reports on their deviation from actual values.

Once you set categories and enter predicted values, the budget module becomes dormant and you can use the transactions module to enter daily expenses and income. Without complete and accurate reporting, Home Accountant is just an expensive time waster.

In a bare bones checkbook configuration, data entry and reconciliation take about an hour a month. If you choose to use full record keeping, plan on spending as much as an hour to enter a week's worth of transactions.

Home Accountant's two data entry shortcuts, automatic transactions and split payment, aren't usually found in a home finance program. Home Accountant allows you up to five automatic entries per checkbook. Every time you run the Start New Month routine, transactions such as monthly car payments or retirement check deposits are automatically entered.

Split transactions are handy for when you write a check at the store and get some cash back. To keep square with your budget, allocate the amount of the check to two categories: food and cash.

Another split payment is insurance that covers both your home and car. You can split transactions among any number of categories, but, of course, the dollar total of the splits must equal the original transaction total.

You enter all transactions in a cash, credit card, or checkbook account. You must specify an existing budget category. This provides some measure of protection, but the most important error trap is when you reconcile the checkbook balances with your bank statement. If a problem occurs, you might need to use Home Accountant's search/edit feature.

You can base a search on something as vague as the dollar amount of a transaction or the budget category, or a criterion as specific as the date and check number. Once you locate a transaction of interest, you can review and correct it.

While this system of checks and balances might fall short of accepted accounting standards in the business world, it should be adequate for home accounting.

The Report Modules

Home Accountant really goes to work when you access the report modules, the most comprehensive of which is aptly named Printed Reports. Within the module are three sections: budget, personal balance sheet, and income/expense summary. Each of these offers several options.

Budget reports range from a simple printout of the categories you've defined and their assigned numbers to a 12-month budget summary. A third printout, identical to the budget summary, lists monthly totals for each category.

Both the actual and budget printouts require 132 columns. However, you might get by with your standard-width printer; Continental includes a software routine that sends user-defined control characters to your printer. That way, printers like the MX-80FT or the NEC 8023 can generate 132-column output using a reduced type size.

The second section of the Printed Reports module produces a personal balance sheet. This report represents your financial health, listing the current balances for all your assets and liabilities, including checking, cash, and credit cards.

On a balance sheet, net worth is literally the bottom line. You can get a

We have CP/M for Radio Shack computers.

2,000 new programs for your TRS-80® 12.

CP/M is the runaway leader in disk operating systems, but until now owners of Radio Shack computers have been locked out of the thousands of useful programs that operate on CP/M.

Now you can put the power of CP/M into your Radio Shack TRS-80 II, 12, or 16, and be able to use all the popular and useful software—and hardware—that has been previously out of your reach.

Use any printer.

Instead of being chained to Radio Shack hardware, you'll be able to add a video terminal, any printer (serial or parallel) and several Winchester hard disk drives with storage up to 80 megabytes.

Yes! Send me free information

Uses only 8.5K of memory.

Since our first version went on the market in 1980, we've condensed and refined it into a compact, easy-to-use system enjoyed by thousands of users.

Besides the standard Digital Research CP/M manual, you'll get the 250-page manual we've developed through our long experience in adapting CP/M to Radio Shack computers. Our manual has lots of examples and an index and glossary.

You'll have your first working disk in ten minutes.

Only \$200.

The floppy disk version of Pickles & Trout CP/M is \$200. The hard disk versions (for Tandy, Corvus, and Cameo) are \$250, except for the multi-user Cameo, which is \$400.

about CP/M for Radio Shack.

Name _____

Address _____

City _____ State _____ Zip _____

Phone _____

or send us your business card.

Pickles & Trout®, P.O. Box 1206, Goleta, CA 93116 (805) 685-4641

TRS-80® Radio Shack/Tandy Corporation. CP/M® Digital Research.
Pickles & Trout® Pickles & Trout. ©1983 Pickles & Trout

✓290



Drive a Hard Bargain™

Super Sale on Hard Drives

We have rewritten the book on Hard Drives. Our hard drives are the fastest (D M A available soon) the most versatile (Newdos^A, Dosplus^B, and Ldos^C drivers), the most adaptable, (runs on the Model I and Model III using the same adapter), but, we must admit, it is the lowest (in cost that is) starting at **\$1,295.00** for a 12 meg. (unformatted) primary and **\$695.00** for a secondary system. All systems come complete with power supply, case, cables and Instapatch™ software drivers for fast-trouble-free installation and operation.

Specifications:

Self Test - Automatic Diagnostics

Error Correction - ECC

Access Time Track-to-Track 3ms

Average Access Time 72ms

Capacity 5-20 Megabyte Formatted

Daisy Chain up to 40 Megabytes

Warranty — one full year. Call for more details.

TOLL FREE ORDERING GENERAL AND TECHNICAL

1-800-343-8841

1-617-872-9090

Dealer inquiries invited.

SOFTWARE SUPPORT, INC.

One Edgell Road, Framingham, MA 01701

(617) 872-9090

Hours: Mon. thru Fri 10 am to 6 pm (E.S.T.) Sat. 10 am to 5 pm

v327

Canada

MICRO R.G.S. INC.

751, CARRE VICTORIA, SUITE 405

MONTREAL, QUEBEC, CANADA H2Y 2J3

Regular Tel. (514) 845-1534

Canadian Toll Free 800-361-5155

TERMS:
M.C./Visa/Amex and personal
checks accepted at no extra charge.
C.O.D., please add \$3.00.
Shipping: Please call for amount.

A "Apperet Inc.
B "Microsystems Software Inc.
C "Logical Systems Inc.
© Copyright 1983



PRICE BREAKTHROUGH

Super Sale on New Disk Drives

Starting at **\$199.95** complete!!
with Power Supply and Case.

Tandon — Siemens — Remex — MPI — Teac — Shugart

single sided 40 track — dual sided 40 track
single sided 80 track — dual sided 80 track

for

**RADIO SHACK¹ — HEATH/ZENITH² — APPLE³/FRANKLIN⁴
IBM/PC-TEXAS INSTRUMENTS⁵& MOST OTHER COMPUTERS**
Drive a Hard Bargain!!™

**8 M.B. - 12M.B. with Power Supply Case, Cables & Software
Complete Systems from \$1,295.00**

**Amazing Special!-dual sided 40TK or 80TK drive with Power Supply and Case
and Our Special Warranty - Starting at \$Call**

TOLL FREE ORDERING GENERAL AND TECHNICAL

1-800-343-8841

1-617-872-9090

Model I/III/IV Drives (0 1 2 3)	starting at \$175.00
Color Computer Drives (0 1 2 3)	starting at \$Call
Apple/Franklin Compatible Add-On Drives	\$229.95
Apple/Franklin Compatible Drives with Controller	\$299.95
Model I/III/IV Memory Upgrade	starting at \$Call
Printers — Daisywheel/Dot Matrix	\$Call
Diskettes	Quantity Priced from \$17.00
Cases and Power Supplies — (Single-Dual-1/2 Height)	starting at \$49.95
Printer Buffers 8K to 512K	starting at \$143.95
Percom Double Density Controller (Model I)	\$Call
Holmes Model I/III Speed-up Mod-VID/80	starting at \$90.00
Gold Fingered Edge Card Extenders	starting at \$13.00
Cables — Printer/Disk Drive	starting at \$25.00
DOSPLUS	\$Special prices
Repair Services Now Offered for Disk Drives — Fast Turn-a-Round	\$Call

One Year Warranty Available on all Drives!

SOFTWARE SUPPORT, INC.

One Edgell Road, Framingham, MA 01701

(617) 872-9090

v 327

Hours: Mon. thru Fri 10 am to 6 pm (E.S.T.)

Sat. 10 am to 5 pm

Canada MICRO R.G.S. INC. 751 CARRE VICTORIA SUITE 405 MONTREAL QUÉBEC, CANADA H2Y 2J3 Regular Tel. (514) 845-1534 Canadian Toll Free 800-361-5155
--

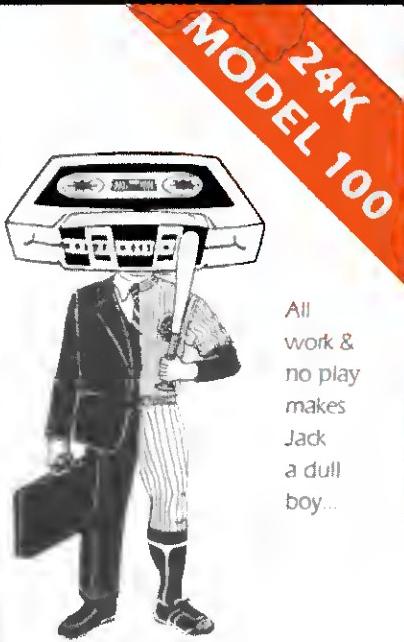
Dealer inquiries invited.

- 1 "TANDY CORPORATION
 - 2 "ZENITH DATA SYSTEMS
 - 3 "APPLE COMPUTER CORP.
 - 4 "FRANKLIN COMPUTER, INC.
 - 5 "IBM CORPORATION
 - 6 "TEXAS INSTRUMENTS
- * Copyright 1983

TERMS:

M.C./Visa/Amex and personal checks accepted at no extra charge.
C.O.D., please add \$3.00.
Shipping: Please call for amount.

REVIEWS



All
work &
no play
makes
Jack
a dull
boy...

HAVE FUN WITH YOUR MODEL 100!

Model 100 Games #1 - 4 games for your relaxation and enjoyment!

BLOCKADE - Your "snake" grows longer as you hit the randomly appearing targets on the screen! A one or two player real-time game.

REVERSI - Outflank your opponent! Play against the computer or another human.

FRANKENSTEIN ADVENTURE - Find all of the necessary equipment to awaken the monster.

ALEXIS ADVENTURE - Sail the seas and traverse the islands to recapture your kingdom.

All four games on tape for only \$24.95. (MasterCard/Visa accepted. Calif. residents add 6% tax. Overseas add \$1 shipping. Dealer inquiries invited.)

SILVERWARE

- a lot of software for a little silver

✓ 102

P.O. Box 21101
Santa Barbara, CA 93121 (805) 966-1449

balance sheet that compares your actual numbers with the budget numbers. A third option is a report that compares one month's data with the previous month's.

The last section of the Printed Reports module comprises the income and expense summaries. Just as the balance sheet calculates your assets and liabilities, the income and expense summary is a picture of the running balances of the income and expense accounts.

Formats include a single month's data, year-to-date totals or a range of fewer months, comparison to a prior month's total, and comparisons to budget. A numerical percentage accompanies each figure, showing its relationship to total income. Reports conclude with net income, the difference between income and expense totals.

The Printed Reports module provides totals only. For the story behind those totals, you'll need to use Home Accountant's Activity Report module.

You can tailor Activity Report printouts to your needs, ranging from a listing of all transactions entered to a highly focused report of transactions on a particular credit card that are tax deductible.

You produce Activity Reports using screens like those in the Transactions module's search/edit function. Specify the criteria of interest and the program searches the transactions file for a match.

Besides listing transactions, the Activity Reports module prints checks. You'll need a special kind of computer-compatible check to do this; Continental Software includes information on where to order them.

To print checks, you must enter the pertinent information in the transaction module, go to the Activity Reports module, and search for the appropriate entry. Before printing, you have a chance to enter a name and address, a handy addition if you want to use window envelopes.

Last but not least among Home Accountant's reports is the Graph module. Available only as a video display, the Graph module generates a histogram comparing 12 months of actual and budgeted values for a given category. The program fits a trend line to the actual values, letting you see what the totals might be in the future.

Home Accountant's features are

aimed at middle- to upper-middle-class households where income comes from salary, most purchases are made by credit card or check, and investments are simple. If you have a complex portfolio or if you wheel and deal, you might want more flexibility than this program offers.

"Your computer-generated reports probably won't substitute for a loan application, but they do add credence to your claims."

Not Perfect

This accounting program's documentation is of mixed quality. For instance, the user's guide includes a brief introduction to the program and a step-by-step walk-through of setting up budget categories, entering and editing transactions, and printing reports.

After the first few sessions, you won't need the manual thanks to the menu-driven format, on-screen prompts, and error trapping. But the documentation falls down in providing realistic examples or advice on how to set up your budget.

Continental provides no demonstration disk or sample data base. If you want to experiment, you must start from scratch.

You must also watch for some pitfalls. Do plenty of planning before setting up your budget categories. Consider what information you need a year down the road; once you start a system, it's difficult to go back and change it.

Don't underestimate the time it takes to maintain accurate records. Ideally, you should keep a handwritten log of your daily expenses, entering them into the computer at least weekly. If you

don't, you might end up lumping many transactions into a miscellaneous account, diluting the value of future reports.

Other drawbacks include the inability to create a back-up of the program master disk, plus frequent and sometimes lengthy waits while the program accesses disks.

My final gripe centers on Continental Software's unusual support policy. To get service direct from Continental, you must shell out an additional \$20. If you choose not to register and you blow the program disk, it costs you \$17.50 for a replacement.

Direct Benefits

Home Accountant's most obvious benefit is its precise tracking of your daily financial activity down to the penny. Such record keeping pays off in two ways.

First, by taking time to record and enter transactions, you become more conscious of your spending. This form of self-monitoring can be effective in curbing excess spending.

A second advantage comes at tax time. Using Home Accountant's records, you can take full advantage of deductions. If, for example, you feel that the standard sales tax deduction is less than that to which you are entitled, you can rely on your computerized records to find out what was paid.

Home Accountant's ability to generate a balance sheet is another plus. These numbers might have little direct impact on your daily habits, but they make it easier when you apply for credit or other forms of financial assistance. Whether for a college scholarship or a home mortgage, an institution is likely to ask questions to determine your net worth.

Your computer-generated reports probably won't substitute for a loan application, but they do add credence to your claims. Stapling a copy of your balance sheet to the application indicates that you are on top of things and that the data you provide doesn't come from thin air.

No financial software package can do everything. It can't replace the advice you receive from a tax consultant or accountant, and it won't magically change the size of your balance. But if tracking your money closely is important to you, Home Accountant might be worth checking out. ■

Now...from Dr. David Lien, the master of making the difficult simple, comes the complete way to **HARNESS YOUR TRS-80**

Face it. Until you can talk to and understand your Model I, II, III or 16 Tandy TRS-80*, it's nothing more than a mass of microcircuits in a plastic box.

You need help to harness your TRS-80 and make it work for you. And that's just what you get from *Learning TRS-80 BASIC*.

Written by David Lien, author of the popular *TRS-80 User's Manual for Level I*, *Learning Level II* and *The BASIC Handbook*, *Learning TRS-80 BASIC* is at once entertaining, informative and easy to understand. It's the perfect guide to entering the world of microcomputers.

In *Learning TRS-80 BASIC*, David Lien gives you simple, step-by-step instructions, including programs you can use in business or home finance, for entertainment, or to help troubleshoot problems. You'll even learn to write your own custom software. Ideal for the classroom, too.

Included are short Question and Answer sections which help make sure you understand everything you've learned—it's almost like a correspondence course...without the correspondence!

No matter if you own the Model I, II, III or 16, *Learning TRS-80 BASIC* is one book no TRS-80 owner should be without.

Available at better computer and book stores,

or call (800) 854-6505

In California (619) 588-0996

Ask about the Basic Handbook, too. To order by mail, send check or money order for \$19.95 (California residents add 6%), plus \$1.65 shipping and handling. Overseas orders send \$19.95 plus \$2.50 surface shipping and handling.

All books have a 30-day money-back guarantee—you can't lose.



CompuSoft® Publishing

535 Broadway, Dept. 1410B3, El Cajon, CA 92021

*TRS-80 is a registered trademark of the Tandy Corporation.

REVIEWS

★★½

TRS-80 for Kids from 8 to 80
Michael P. Zabinski
Howard W. Sams & Co. Inc.
4300 W. 62nd St.
Indianapolis, IN 46268
\$9.95

by Richard Ramella

My 7-year old son got first dibs on this book. Five minutes after he disappeared into the computer room with it, I heard a whoop and he came running into the front room. "It works!" he yelled. He successfully entered and ran a program on his own.

That's the most important thing I can say about *TRS-80 for Kids from 8 to 80* by Michael P. Zabinski, founder of the National Computer Camp. The material works and encourages the reader to keep going. Any beginner can profit from this book's approach.

The 11 short chapters are in a workbook form familiar to elementary-school students. They include lots of white space, room to write in answers, illustrations, and humor.

The first chapter describes the TRS-80 Models I and III and sets the tone for what follows: simply presented material and questions designed to make the user look carefully at the computer. He'll also want to experiment.

The book increases in sophistication step by step. The user learns concepts, types in material, and—in the best of all possible worlds—gets the important idea that he can change parts of a program to make the computer perform interesting tricks.

The last chapter contains seven longer programs. The user, no longer a beginner, might have to work hard to get these programs running, but that's good. You can learn a great deal by keying in published programs.

One warning: Children enjoy achieving on their own, but an experienced adult should be ready to offer necessary help, no matter how simple the material. Tactful assistance keeps frustration low and encourages the child to continue alone.

TRS-80 for Kids is the first of two volumes. The second book offers more Basic programming concepts. I recommend this book, especially for children. Absorbing even a few of the ideas here will get them on their way to Basic competency. ■

★★★★½

Forms III
Model III
\$125

★★★★★

Prosor III
Model III
\$150
Combination price: \$225

The Small Computer Company
230 W. 41st St.
Suite 1200
New York, NY 10036

by Wynne Keller

Forms and Prosor are both superb enhancements to the popular Profile III+ data-base management software. They feature extensive new printout formats and sort/select capabilities. Serious users won't want to be without them.

Forms

The Forms programs let you format virtually any type of report and have complete control over the placement of fields on a page. This frees you from the limitations imposed by Profile III+ relative to the number of lines per record and the spacing between records.

The Forms programs come on a TRSDOS-formatted disk. Using simple Do file commands, you transfer some of the programs to your Profile Creation disk and some to your Runtime disk. This transfer creates a new menu that offers extended file functions.

The Forms programs come with a 65-page manual in a three-ring binder that includes an index and a table of contents. Experienced Profile users have little need for this manual because the Forms formatting instructions are similar to those for Profile's Report generator.

For those who need more help, the Forms disk provides a complete sample data base, and the manual provides a tutorial on creating an invoice form.

The largest form possible is 132 characters wide and 66 characters long. You can specify a shorter length, and you control width by proper field placement.

You have to be careful not to locate a field so that it overruns the form. If it does, a solution might be to print the form in reduced character format.

In developing a format for your form, you'll want a printout ruler to measure character width and line length. The screen displays the cursor position at all times.

Using the arrow keys and a few other keys, position the cursor and type. You can place almost anything on the form, including special characters if you have a printer that supports them.

As with Profile, the @ symbol prints the record number. Pressing the asterisk and field number prints that field. You can force fields to the left to close up spaces between adjacent fields. The program supports page numbering and dating.

Printouts

The program creates fancier printouts using special functions like underlining and half-line feeds if you have a Radio Shack Daisy Wheel II printer; a Dot Matrix 200, 400, or 500 printer; or a Line Printer V or VIII.

With some printers, you can also print characters not found on the keyboard, such as fractions or the English pound symbol.

If you have a different printer, four user-defined codes are available. This process requires patience and involves patching one of the programs with the hexadecimal codes for your printer. It should take programmers less than a half hour to make the changes.

The program does not have an option to select print size, but you can patch this into the spare codes, too.

To print records with Forms, you first have to build an index with Profile III+ or Prosor because Forms doesn't have sort or select capabilities.

Forms III is a fine program. It's easy to use and increases Profile III+'s flexibility tenfold.

Prosor

Prosor solves a variety of the problems inherent in Profile III+. With Profile III+, you can divide a data file into three segments, and any field used for sorting has to be in the first segment. Since the first segment cannot exceed 255 characters, some fields you want to sort might not meet this restriction.

Also, you have to assign field numbers in the proper order. The primary sort field must be first with the secondary sort field immediately following. For instance, Profile III+ would never sort a data file organized as part

UNITED SOFTWARE ASSOCIATES

PRESENTS

ULTRA TERM

A FULL FEATURED TERMINAL PROGRAM

The Ultra Term communications package is one of the easiest to use and most versatile communications programs available for the TRS-80. It includes a full featured intelligent terminal program, with all the popular features of competing programs costing two to three times as much, and some new features that can't be found anywhere else at any price. Ultra Term also includes a self relocating host program, and hex conversion utilities for bulletin board downloading. Some of Ultra Term's unique features are:

- Supports both manual and auto dial modems
- Exclusive Ultra Term direct to disk file transfer mode, allows unattended operation at the receiving computer
- Exclusive split screen feature allows simultaneous two way communications without confusion.
- Line printer support with a 1K print buffer.
- Half and full duplex support.
- Universal ASCII format file transfer with a 33K Buffer.
- A full featured host program

• ULTRA TERM	\$59.95	• LYNX MODEM	\$249.00
• INFOEX 80	\$99.95	• ANCHOR 1-300	\$99.00
• M TERM	\$69.95	• HAYES 300	\$249.00
• COMBAT	\$44.95	• HAYES 1200	\$619.00
• MODEM GAMES	\$19.95	• ORCHESTRA 85/90	\$89.00
		• PIANO SOFTWARE	\$34.95

ORDERS 305/965-3496 BBS 305/842-2687
COD ADD \$3.00 TECHNICAL INFOR. 305/842-8805 (5-9 E.S.T.)
734 Flamingo Way, North Palm Beach, FL 33408

✓332

Shugart 5 1/4' Disk Drive

SA-405

184.95

Guaranteed for 270 days

6ms T-T, SS, SD or DD

5 1/4" Disk Drive Power Supplies

- Cases accommodate all standard 5 1/4" drives
- New chip resistant finish
- Over current and over voltage protection
- Dealer inquiries invited
- Call or write for quantity discounts
- Guaranteed in writing for 120 days

Dual Power Supplies

- | | |
|--|---------|
| • Horizontal - 12x12x3 1/2 | \$74.95 |
| • Vertical - 7x12x6 | \$74.95 |
| • Open Frame - 7x2x3 w/o case | \$59.95 |
| • Single Horiz P/S - 6x12x3 1/2 | \$44.95 |
| • Custom 4' 2-Drive Cable | \$21.00 |
| • 4-Drive Cable | \$32.00 |
| • Dual Case, Horiz. or Vert. (w/o P/S) | \$29.95 |
| • Single Case, Horiz. (w/o P/S) | \$21.95 |

Terms: Personal checks allow 14 days, C.O.D., M.O., Certified Checks . . . Credit Cards add 3.5% Shipping and Handling: \$3.00 West and \$5.50 East states. All shipping UPS surface, other means extra. Canadian orders extra.

Send to:

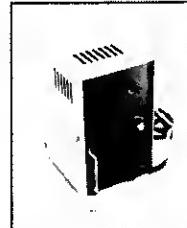
C.P.R.
P.O. Box 834,
Oak Harbor, WA 98277

or call . . .
(206) 878-4797

✓420

DISCOUNT

TRS 80™ Model I & III External Mini Disk Drives



Single Chassis

With Power Supply:

Fully assembled silver chassis with external card edge connector for easy cable installation. Chassis includes power supply and one Tandon drive.

★ TM 100-1 With Chassis	\$235
★ TM 100-2 With Chassis	\$305

Tandon Bare Drives:

★ TM 100-1 Single Sided 40 Track	\$179
★ TM 100-2 Double Sided 40 Track	\$249
★ TM 848-1 8" Half Height Single Sided	\$300

CDC Bare Drives:

★ 9409 5 1/4" Double Sided 40 Track	\$249
--	--------------

Printers

Epson:	Okidata:
MX80 W/Graftrax	\$399
FX80	\$569
MX100 W/Graftrax	\$649
Star-Micronics:	C-Itoh:
Gemini-10	\$319
Gemini-15	\$469
Smith Corona:	Brother:
TPI	\$499
	HR1
	\$789

Free Shipping!

Under \$100 - Tell Freq

1-800-531-5475 (Outside of Texas)
(512) 250-1523 (In Texas)

VISA • MasterCard • Money Order • Cashier's Check
Add 5% Sales Tax If Texas Resident

TRS 80 Is A Trademark Of Tandy Corp.

✓252

CompuAdd

13010 Research Blvd.
Suite 101
Austin, TX 78750

number, part name, and vendor code first by vendor, then by part name and number. To do so, vendor would have to be the first field.

Field length is nearly as important as field placement. The primary sort must include all the primary sort field, then as much of the secondary sort field as fits in the computer's memory. If the primary sort field is long, the secondary field might not fit.

These sort limitations are a serious problem in some applications. Initializing Profile III+ requires an extraordinary amount of advance planning, and it provides no flexibility should your needs change.

Prosort allows sorting by any field, in any order, from any segment, ascending or descending. You can save the indexes created by these sorts on disk and use them for printouts. It's also possible to build one index from another, thereby fine-tuning the selection process as much as necessary.

The Prosort programs come on a formatted TRSDOS disk. You can transfer them to your own Runtime disk with a simple command.

The 77-page manual has a hard cover and a three-ring binder. It's divided into a sample section and a reference section. The sample is a step by step tutorial using a data base provided on the disk. The reference section provides similar information in a more condensed form.

Running Prosort

Access Prosort through the Extended menu, which offers Prosort itself, printing labels or reports from Prosort indexes, and selection of records from a Prosort index.

You can save five indexes on disk for reports, and use a sixth for searches in the regular portion of Profile III+. This sixth index, the Inquiry index, replaces the regular Profile index, and you access it from the usual Profile menu.

To build an index, specify the fields to sort and search. Five fields from any segment of the data file can be included in the sort. You control the length of the field to be sorted. Sorting just the first few characters of the field improves speed, and is frequently all you need.

You can put each field in ascending or descending order. Best of all, the sort fields do not need to fit in memory. If the file is too large, the program automatically sorts in segments, and the segments merge together into a single index.

The search can total 16 fields, but this number is misleading because you might use some fields more than once in the search. For example, if you want to search a range, enter the field of the range twice: once for the low number, once for the high.

Similarly, to search the state field for AZ, CA, and NY, you must select the state field three times. Even so, 16 fields should be adequate for most needs.

After specifying the select fields, enter the search relationship (And or Or), the search mode (Equals, Range, and so on), and the search item.

The sort/search then proceeds. I sorted four fields in a 225-record data base and the computer was busy less than a minute. When I added search operations, it was slightly slower, but well under two minutes. It takes you longer to set up the sort/search than it takes the computer to perform it.

Once you establish it, you can use an

index over and over. Of course, you'll want to re-sort whenever you make changes or additions in the data base.

This points up the only flaw I found in the program: It doesn't save the search/sort criteria for any particular index. If you decide to re-create an index, you must start over specifying which fields to sort and search.

It is possible to create an index from another index. In this way, you can achieve sophisticated selection. Prosort also supports mass updates on an index. This permits the recalculation of math formulas on selected records—a powerful enhancement. The SuperScripsit merge also functions from Prosort indexes.

Forms and Prosort require a multi-drive system. Their sort/select and printout capabilities are valuable enhancements to your Profile III+ data base. If you depend on Profile, don't miss them. ■



Optimal Manager
Transpower Corporation
1 Oak Drive
Parkerford, PA 19457
Model II, two disk drives
\$495

by Charles R. Perelman

Here's your opportunity to improve efficiency by applying statistical and operations research techniques to your business. Optimal Manager is an impressive potpourri of quantitative analysis and useful algorithms that Ronald Satz has gathered into 47 Model II programs covering many common business problems.

Three 8-inch disks contain the routines in compiled Microsoft Basic. Other versions are available for CP/M and Xenix operating systems.

You need two disk drives to run the software. Distribution disks are password protected and autoload from initialization to prevent copying or tampering.

If a disk is damaged, a registered user can obtain replacement disks from Transpower for \$20. They furnish registered owners with any updates. If you

have problems, call or write the author.

What the Programs Do

All programs are grouped in four modules: Optimal Product Investment, Optimal Product Manufacture, Optimal Product Distribution, and Optimal Product Pricing and Advertising.

You use a wide range of mathematical and statistical techniques for improving business efficiency, including probability concepts, linear programming, dynamic programming, queuing theory, integer programming, network analysis, game theory, and Markov chain analysis.

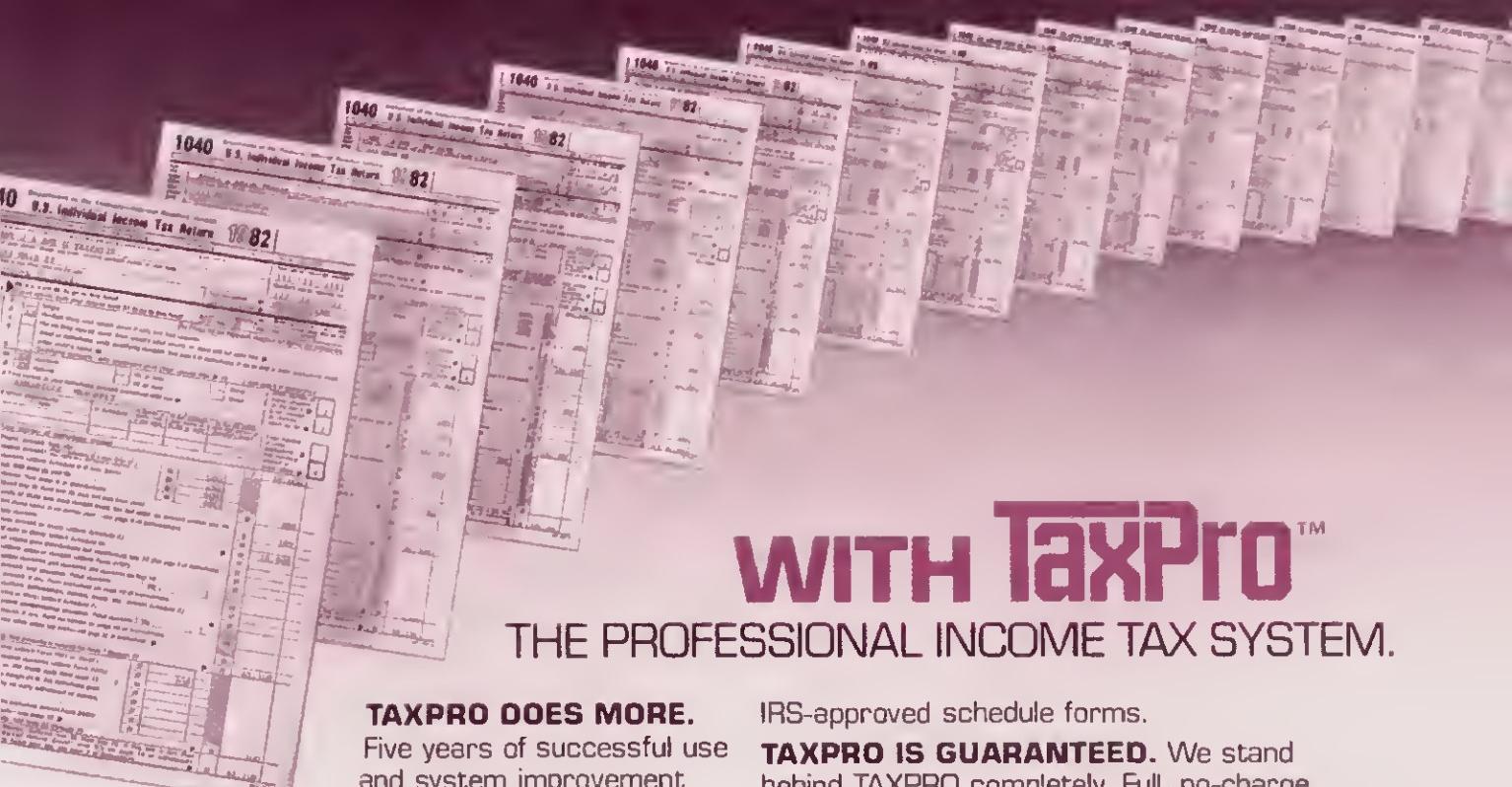
Your computer handles the complex mathematics, repetitive calculations, and iterations, so you don't need to understand calculus or any underlying theories.

However, you need to know the fundamentals of quantitative analysis management techniques or have ready access to a reference text to get anything meaningful out of this package.

I tested more than half the programs. All performed without error. The formats for the other programs were either more sophisticated or varied enough from the texts I consulted so I couldn't validate them with my references.

With Optimal Manager you can forecast components of your business plan such as market share, demand, product

INCOME TAX OFFICES: MULTIPLY YOUR OUTPUT.



WITH TaxPro™

THE PROFESSIONAL INCOME TAX SYSTEM.

TAXPRO DOES MORE.

Five years of successful use and system improvement has pushed TAXPRO far beyond Form 1040 and its supplemental schedules. This versatile system also totals W-2s, computes FICA overpayment, calculates tax alternatives . . . even prepares client billing.

supplemental schedules. This versatile system also totals W-2s, computes FICA overpayment, calculates tax alternatives . . . even prepares client billing.

TAXPRO IS INTELLIGENT. It analyzes the client's tax picture, suggests the best route to go. Determines eligibility for special forms such as minimum/maximum tax, income averaging, to name a few.

TAXPRO IS EASY.

Because it follows the tax forms line by line. Taxes are automatically figured, entered everywhere they apply. Change any entry, and all relevant data is automatically revised. Produces a printout that exactly fits 1040 and

IRS-approved schedule forms.

TAXPRO IS GUARANTEED. We stand behind TAXPRO completely. Full, no-charge support through the tax season. Inexpensive, yearly system updates. Over 5 million returns prepared with no reported errors.

TAXPRO BUILDS PROFITS. The door is open to higher profits than you have ever enjoyed. Double, triple, or quadruple your output; pay for TAXPRO and the computer in one tax season.

If you do income tax returns, you need

TAXPRO, the truly professional, computerized income tax preparation system.

Look into it today.

Contract Services
Associates,

706 South Euclid,
Anaheim,
California 92802,
(714) 635-4055.

45-PAGE DESCRIPTIVE
SYSTEM MANUAL: \$7.50



CSA

CONTRACT SERVICES ASSOCIATES

Improving the bottom line.

v68

LOAD 80

**TO YOUR
RESCUE**

LET LOAD 80 AND COLOR LOAD 80 RESCUE YOU

In the dawn of the computer age programmers needed the patience of Job to manually keyboard all the major program listings from a single issue of 80 MICRO.

Then LOAD 80 burst onto the scene and exploded that practice. Today thousands of TRS-80* owners use LOAD 80 cassettes and disks every month. These time-conscious computerists spend more time enjoying all the benefits of those 80 MICRO programs.

LOAD 80 programs come directly from 80 MICRO giving you complete and detailed documentation right there in the magazine. And now, the new disk transfer system allows Model III users to run LOAD 80 disks without conversions.

Save close to 30% on the single issue price by subscribing to LOAD 80 today (choose either monthly cassettes or disks).

Color Computer users can now order our September 1983 Quarterly, containing programs from the August, September and October issues of 80 MICRO (available September 1983). Also available is the "Best of '82" cassette, containing Color Computer programs from the 1982 issues of 80 MICRO.

Start enjoying all the benefits of the programs in 80 MICRO without all the programming hassles. Fill out the attached order form and send it to LOAD 80, 80 Pine Street, Peterborough, NH 03458. Or call toll free and use your MasterCard, Visa, American Express.

ATTENTION MODEL III USERS

New, Improved Operating System!
—Ready To Run!!

1-800-258-5473

NEW DISK TRANSFER SYSTEM ALLOWS LOAD 80 TO NOW BE RUN ON MODEL III SINGLE DRIVE UNITS WITH NO CONVERSIONS NECESSARY!!

LOAD 80 is simply the listing from 80 MICRO. Use the KEYBOX accompanying each article as your guide to system configurations. LOAD 80 runs on the *TRS-80 Model I and Model III computers only. COLOR LOAD 80 runs on the *TRS-80 Color Computer only. *TRS-80 and Color Computer are trademarks of Radio Shack, a division of Tandy Corp.

Yes! Send me the September LOAD 80

9-83

Disk \$21.47 Cassette \$11.47

Price includes postage and handling.

Foreign air mail please add \$.45 per item for postage and handling.

Please enter my subscription for one year, beginning with this month's issue. Disk \$199.97 Cassette \$99.97

Check/MO MC Visa AE

Card# _____ Exp. date _____

Signature _____

Name _____

Address _____

City _____ State _____ Zip _____

LOAD 80•80 PINE ST. •PETERBOROUGH, NH 03458

Yes! Send me the COLOR LOAD 80

9-83

3rd Quarterly at \$11.47 (August, September, October)

"Best of '82" at \$16.47

Price includes postage and handling.

Foreign air mail please add \$.45 per item for postage and handling.

Check/MO MC Visa AE

Card# _____ Exp. date _____

Signature _____

Name _____

Address _____

City _____ State _____ Zip _____

COLOR LOAD 80•80 PINE ST. •PETERBOROUGH, NH 03458

PRICES AND SERVICE TOO GOOD TO PASS UP!

PRODUCTS FOR THE TRS-80®

COLOR COMPUTER

	tape	disk
Diagnostics	17.25	
Graphics Editor	17.25	
Master Control II	22.95	
Bugout (Monitor)	16.95	
Oracle (Graphic Monitor)	25.75	
Ultra 80 CC (Editor/Assembler)	42.50	
Ultra 80 CC Plus Oracle	64.95	
Soundsource (with Cable)	21.95	
Color Games by Lance	15.95	
CC thello	12.75	14.95
Ghost Cobbler, Space Invaders	17.50	20.50
Colorout		11.95
Color Bonanza	42.95	
Color Caterpillar or Death Trap	17.25	
Color Scarfman	17.25	
Deathplanet: The Dogstar Adv.	15.95	
Mean Craps Machine	15.95	

GAMES

	tape	disk
Attack Force or Cosmic Fighter	12.75	15.95
Stellar Escort or Galaxy Invasion	12.75	15.95
Meteor Mission II or Robot Attack	12.75	15.95
Defense Command or Super Nova	12.75	15.95
Weird	15.95	15.95
Forbidden City or Forbidden Planet		29.95
Hyperlight Patrol		15.50
Defiance (Disk Only) or Panik	15.50	19.50
Devil's Tower	12.75	15.95
Alien Defense or Bounceoids	13.95	17.25
Sneak Thief	17.25	18.95
Frogger	17.25	19.95
Reign of Red Dragon or Stratos	19.95	19.95
Double Feature		31.95
Caterpillar or Scarfman	13.95	17.25
Penitator	21.75	21.75
Armoured Patrol or Eliminator	19.95	19.95
Rear Guard or Sea Dragon	19.95	19.95
Adv Tripac 1-3, 4-6, 7-9, or 10-12		31.75
Adventure International Hint Book		6.95



Newscript 7.1	99.95
Newscript 7.1 plus Labels	114.95
Newscript Daisy Wheel Prop.	39.95
Newscript File Converter	19.95

LYNX MODEM

Auto Answer & Auto Dial
for the TRS-80 Models 1 & 3

\$229

DOT WRITER 3.0

\$66.50

Dot Writer Font Disks — \$23.50

GEAP

\$38.50



Includes Correcting Feature

\$119.50

Grammatical Option	39.95
Hyphenation Option	39.95

TALLYMASTER

Designed to help those running a business or household. It is easier to learn than most spreadsheet programs and includes complete documentation and an on-line HELP command. Handles up to 702 expense or income categories. (By Prosoft, requires 48K, 1 disk drive)

\$64.95

SOFTWARE

NEWDOS80/Vers. 2	\$124.95
LDOS 5.1	109.95
DOSPLUS 3.5	119.95
DOSPLUS II	195.00
Micro Clinic — 24.50	
Micro Clinic — Mod 3	28.50
Trashman	34.50
Faster	24.95
R.P.M. — Disk Timer	22.50
Super Utility Plus 3.0	63.95
EDAS IV	84.95
M-ZAL Release Two	119.50
LDOS Utility Disk	42.50
LDOS FED (File Editor)	33.95
The BASIC Answer	59.95
Lazewriter Version 3.0	139.95
Lazystuff	34.95
Lazydoc	49.95
Maxi Manager B.O.	119.50
Maxi Mail (Mod 3 Only)	74.95
Maxi Stat	164.95
Maxi CRAS	79.95
The Home Accountant	62.95
Tallymaster	62.95
The Postman Deluxe	99.95
The Postman Deluxe w/Postwrite	123.50
Microterm	64.95
Omniterm	79.95
Percom Doubler II w/ Dos +	3.4
	159.95
Percom Doubler II w/o Dos	139.95
Percom Data Separator	27.95
LNW Doubler 5/8 w/ Dos +	194.95
LNW Doubler w/o Dos	159.95
LNW System Expansion II	349.00
Small Business System Group's Accounting Modules — Mod 1 or 3	175.00
Accounting Modules — Mod 2	250.00
Verbatim Disks 5" SS/DD	26.50

- 24-Hour Shipping for Items in Stock
- Free Use of Credit Cards
- Large Selection—Call for Items Not Listed

- Toll Free Order Line
- Free Shipping on Orders over \$100
- Friendly, Honest, Reliable Service

We accept Visa, Master Card, check, cash, money orders, and COD. In the 48 continental States add \$2.50 for UPS standard shipping, we'll pay shipping if your order is over \$100. Alaska and Hawaii orders are charged actual shipping charges. COD orders are charged an extra \$2.00 and require cash or certified check on delivery. POs accepted upon approval.

When ordering by mail, include your telephone number, credit card information, computer model, memory size, and number of drives. Colorado residents add appropriate sales tax (6½% in Denver).

Prices are subject to change without notice.



Applied Microsystems, Inc.

612 Washington, Denver, CO 80203

1-800-468-4474

IN COLORADO CALL 861-9250

cost, pricing, profit level, and plant expansion alternatives. You have several inventory control models as well as machine reliability, maintenance and replacement policy evaluations, resource allocation techniques, and quality control measurements.

Determination of the critical path for a Project Evaluation and Review Technique (PERT) network, and other scheduling and quality control routines are presented. You can use the system to evaluate job applicants, assign employee tasks, and select project teams.

Other programs help you determine plant or warehouse locations, shortest delivery routes, and shortest distance or cost for shipment or maximum flow path. Waiting line (queuing) procedures measure efficiency in serving customers.

Investors can benefit from programs that allocate investment funds, select a stock portfolio, and determine when to sell appreciating assets. Output is an optimum management solution, as the system name indicates.

To his credit, Satz has structured program inputs for practical application. This causes problems at times because of the rigidity of the system. No provision is made, and no information is given, for using a program if you are missing some of the inputs.

Running the Programs

From the master menu you choose a submenu listing all programs in a particular module, then select again from the submenu for the actual program. The program prompts inputs with an opportunity for correction.

After you enter all data, the program screens all input prompts individually without showing the data you previously entered. You must either enter new data or press the enter key if you recall that the original input is satisfactory.

Each time you rerun a particular program, the same input prompts appear. Pressing the enter key retains input data from the prior run. Reentering unchanged data using the enter key is fine, but not having the prior information on the screen for review is a problem. Since the disk is protected and the program compiled, you can't patch it to correct such an oversight.

Each program produces both screen and printer output. After completing a run with hard copy, "Dual Routing now OFF" might appear. Satz claims

this is a TRSDOS defect that shows up on some printers.

In the output, the program lists all parameters that the user specifies, but it often doesn't print assumptions chosen from screen menus. Printing them would produce a complete presentation.

If you want to abort a routine, Reset is your only recourse. You must use TRSDOS initialization with autorun of Optimal Manager. Neither the hold nor the break key is active at run time. Satz states that these problems are unique to

when you try to correct an entry and can't view the original data.

Documentation

The distribution disk is configured for thin-line disk drives. Instructions in the manual for deactivating the thin-line patch for the standard Model II are incorrect.

I finally booted drive zero with a system disk for the Model II containing Patch. Then I switched this disk to the second drive and ran Unthin with the distribution disk in drive zero to make the necessary DOS changes. The documentation is being revised to correct this.

The manual is nicely prepared in a padded three-ring binder with plastic envelopes for the distribution disks. It is clearly and legibly printed with wide margins. You get a sample solution run for each program, a description that usually consists of one paragraph, and reference notes commenting on one or more input or output factors.

Unfortunately, the descriptions don't mention alternatives offered in some programs. Obviously, they need explanation. Each program has a screen description that you can read or skip since it duplicates the manual and offers no further enlightenment.

Pros and Cons

Optimal Manager is on the right track in offering a whole gamut of menu-driven programs that propose solutions to everyday business decisions.

Operations research proponents or students of quantitative analysis techniques might take issue with some of the models selected, but this comprehensive package gives managers insight and provides computer simulation for different resource allocations and business game plans.

Satz fails, however, to reach the level of most business decision-makers who are unskilled in quantitative analysis jargon and have no background in managerial science. I strongly disagree with his statement on the last page of the manual that "Inputs and outputs are very clear and simple to understand."

A number of programs require input of figures for standard deviation. Nowhere in the programs or manual is this fundamental statistical measure defined or its use explained. If you do understand the implications of its use, you'll want a table of area under the normal probability curve or a program to deter-

"You can use the system to evaluate job applicants, assign employee tasks, and select project teams."

TRSDOS and don't occur with other operating systems.

Other annoying program features include the following.

- Solutions scroll too rapidly to read, so you need a printout to review the entire output.
- The lack of a top-of-form prior to printout results in gaps in schedules when top-of-form occurs in the middle of a solution.
- Inability to change the length of page although the TRSDOS Forms information appears during each printout routine.
- Most punctuation not accepted in titles apparently results from using Input put rather than Lineinput.
- Lack of commas in large numbers makes them hard to read.
- No identifying numbers when you enter a series of related inputs such as a data table makes it difficult to keep track of entries.

For example, the second item might be followed by seven or eight unnumbered question marks for entry of parameters or details relating to that item. This problem is compounded

REVIEWS

mine the area, neither of which is included.

Similarly, such terms as regretist, Poisson distribution, Erlang distribution, penalty coefficients, and sigma limits appear throughout the manual or programs without definition and some are abbreviated without explanation.

The manual tells you, for example, that the program uses the Cobb-Douglas function to determine proportions of labor and machinery for optimal production results. You enter two exponents, but you get no explanation of their significance. The reference note states that exponents are usually between 0.4 and 0.6.

After some research, I found that the exponents apparently relate to the relative increase in product from applying a 1 percent increase in labor or ma-

chinery (capital in the original Cobb-Douglas function). Quality documentation should explain all essential terms and illustrate usage if it's not obvious to a complete novice.

Figure 1, a documentation sample, is the description and reference notes for an algorithm to determine the shortest route through a network. Many manual descriptions contain more technical lingo than this one.

You can use this program to determine shipping routes between two destinations when a number of alternative paths exist. Figure 2 is the solution. A vertex is equivalent to a location or town at a junction in the network of connecting roads.

To use Optimal Manager, the majority of businessmen need a manual that contains definitions of unusual, scientific,

or statistical terms in plain English, or at least some explanation of why a measure or parameter applies.

The manual also needs instructions for obtaining data required for input where not obvious or instructions on using estimated amounts for standard deviation.

A discussion of the meaning of results, including the significance of probability distributions, the meaning of regretist and other alternative choices, and the effect of penalty coefficients or other limitations on accuracy is missing.

The manual doesn't contain a presentation of the actual algorithm and references for further information on the technique and statement of assumptions inherent in the method. This would help interested users understand routines of special value to their business, then use the specific algorithm as the basis for a customized program.

In fairness, Satz often indicates the general analytical method or names the algorithm applied, and he lists four texts on the last page of the manual as the sources of some of his material. I found these references difficult to locate. You'll need more information if you want to go beyond mechanical use of the program.

The average user also needs statements of the algorithms' limitations and assumptions necessary for validity.

Suggestions of other types of problems for which a routine is suitable would be helpful. A limited number of alternative applications are mentioned in a few instances, but some of the programs have wider applications than title designations indicate.

The interface of manager and scientific analytical procedures through the documentation must be improved to render Optimal Manager truly useful. The software needs more tutorial documentation written in non-technical terms.

If you are familiar with quantitative analysis as applied to management decisions or are willing to spend time studying textual material to interpret the required inputs and meaning of outputs from these optimization programs, Optimal Manager is a worthwhile investment.

Be sure the range of methods encompasses problems you face. The software represents a considerable programming effort and furnishes a broad array of analytical management tools. ■

PROGRAM UNIT III. 5: MINIMUM DISTANCE OR COST PATH

Description

This program unit uses Dijkstra's algorithm to locate the shortest path through a directed graph, given the distance matrix (distance from each vertex to each other vertex). Inputs to the program unit consist of the number of vertices in the graph or network, the distance matrix, the starting vertex, and the ending vertex. The program unit outputs consist of the sequence of vertices on the shortest path and the length of this path.

Reference Notes

Devise the distance matrix of your network before running this program unit. Remember that the "distance" may actually be cost or time, whichever is relevant to your problem.

Figure 1. Sample documentation.

Distance Matrix

Vertex	1	2	3	4	5	6
1		17		31		
2	17		12	29		
3		12		16		
4	31	29	16		5	17
5				5		10
6			32	17	10	

Sequence of Vertices on the Shortest Path:

1, 4, 5, 6

Minimum Distance From Vertex 1 to Vertex 6: 46

Figure 2. Solution to algorithm in Fig. 1.

REVIEW DIGEST

RAM Sledges, XYZ Computer Dimensions Inc., Two Pennsylvania Plaza, Suite 1500, New York, NY 10121, Models I and III, \$25.

"The RAM Sledges program does what its makers claim. It makes Z80 programs relocatable and provides all the code necessary to do this."

"...This product will be useful for intermediate to advanced assembly-language programmers. It relieves much of the tedium associated with writing relocatable Z80 code and suffers only from the fact that you cannot specify segments of a program for relocation." *Info-World*, June 27, p. 50.

The Complete Book of Word Processing and Business Graphics, Walter Sikorowiz, Micro Text Publications Inc., Prentice-Hall Inc., Englewood Cliffs, NJ 07362, paperback, \$14.95.

"While both word processing and business graphics are indeed thoroughly covered in this informative and comprehensive (if somewhat dry) work, nowhere are the two combined to show how graphics and charts, for example, can be incorporated in a report without cutting and pasting."

"...The book offers extensive—but by no means complete—lists of manufacturers of computers, peripherals, and software, and concludes with a well-stocked glossary." *Personal Computing*, July, p. 141.

The VC Formula Printer, The Alternate Source, 704 North Pennsylvania Ave., Lansing, MI 48906, Models I and III \$39.95, Model II version under special order \$49.94.

"...a series of linked machine language programs...read a standard VisiCalc file and then send to your printer the formulas in a layout that is like the spreadsheet you created."

"...This product provides an ex-

cellent, easy-to-read, logically arranged listing of the VisiCalc formulas. ...It solves for many of us the problem of obtaining easily read and understandable hardcopy backup. It aids in program development by eliminating the wasteful use of computer memory...." *Basic Computing*, July, p. 114.

Alcor Pascal and Advanced Development Package, Alcor Systems, 800 West Garland Ave., #204, Garland, TX 75040, Models I and III, 48K, one disk drive, Pascal \$199, ADP \$125.

"Alcor Pascal is a powerful language-development system. ...Nearly all of standard Pascal is implemented along with many useful extensions to the language. The performance of Alcor Pascal programs is usually much better than equivalent programs written in BASIC, and the Advanced Development Package Z80-code-generator option lets you produce even faster programs." *Byte*, July, p. 470.

ListMaker, Reader's Digest Services Inc., Microcomputer Software Division, Pleasantville, NY 10570, Models I and III, \$97.50.

"...ListMaker can handle large numbers of records, of course; its limitation is that it lacks the sophisticated multi-level sorting capabilities often required when working with long lists."

"...because the program is menu driven and interactive, it is extremely easy to use. ...Error handling was excellent. When trouble occurs, the program displays an error message in plain English." *Creative Computing*, June, p. 100.

SuperScripsit 1.1.0, Tandy/Radio Shack, One Tandy Center, Fort Worth, TX 76102, Models I and III, Disk systems, \$199.

"Radio Shack has released an updated version of SuperScripsit, version 1.1.0, which corrects some of the problems associated with the original release."

"...It appears that this updated release has not lost any of the special features that made the original version so powerful. ...The special printing capabilities are more accessible now that drivers for all of the current Radio Shack printers are provided." *Basic Computing*, July, p. 113.

NEWBASIC 2.0, Modular Software Associates, 209 18th St., Huntington Beach, CA 92648, Models I and III, \$39.95.

"NEWBASIC 2.0 adds a set of powerful commands to Disk Basic. ...A total of 49 new commands may be added."

"...NEWBASIC is a very useful tool for anyone programming in BASIC who wants very high speed graphics and animation effects that are simple to program, and needs the advanced commands and time-saving features this program provides." *Basic Computing*, July, p. 110.

Pro-Color-File, Derringer Software Systems, P.O. Box 5300, Florence, SC 29502, Color Computer, \$79.95.

"...there will be a number of hours between 'program-arrival' and 'up and running', but I believe the effort is worth it."

"Pro-Color-File is a very sophisticated data base management program.... P-C-F can best be described as a system rather than a program, because it consists of 8 programs and one control file, plus a series of at least 7 control and data files for each database.... I describe it in such detail to indicate the versatility of the systems not the demands the system makes on the user." *Color Computer News*, June, p. 22.

CALENDAR

September

- 12-14 IEEE Computer Society, Silver Spring, MD. **International Conference on Computer-Aided Design** Santa Clara, CA.
- 15-18 Northeast Expositions Inc., Chestnut Hill, MA. **Twin Cities Computer Show and Software Exposition** Minneapolis Auditorium, Minneapolis, MN.
- 16-18 **Great Southern Computer and Electronics Show** Veterans Memorial Coliseum, Jacksonville, FL.
- 16-18 **Compufair Seattle** Center Exhibition Hall, Seattle, WA.
- 19-21 American Management Associations, New York, NY. **User Documentation Course** Washington, DC.
- 22-24 Northeast Expositions Inc., Chestnut Hill, MA. **Rocky Mountain Computer Show** Merchandise Mart, Denver, CO.
- 26-29 IEEE Computer Society, Silver Spring, MD. **Compcon Fall '83** Marriott Crystal Gateway, Arlington, VA.
- 29-Oct 1 Northeast Expositions Inc., Chestnut Hill, MA. **CP/M '83** East Hynes Auditorium, Boston, MA.

October

- 3-6 IEEE Computer Society, Silver Spring, MD. **8th Data Communications Symposium** Cape Cod, MA.
- 5-6 DeNardi Enterprises, Los Altos, CA. **Compusource '83** Red Lion Inn, San Jose, CA.
- 7 Creative Learning Association, Charleston, IL. **Compucon '83** Martin Luther King University Union, Charleston, IL.
- 7-9 **Great Southern Computer and Electronics Show** Expo Center, Orlando, FL.
- 7-10 Institutes for Human Resources Inc., New Smyrna Beach, FL. **The Electronic Village Expo '83-84** Tupperware Convention Center, Orlando, FL.

- 8-9 Tidewater Radio Conventions Inc., Portsmouth, VA. **Computer Convention/Flea Market** Virginia Beach Pavilion, Virginia Beach, VA.
- 16-18 Texas Association for Educational Data Systems, Austin, TX. **TAEDS 1983 Convention** Hilton Hotel, Austin, TX.
- 18-19 Architecture Technology Corp., Minneapolis, MN. **Conference on Local Computer Networks** Hilton Inn, Minneapolis, MN.
- 18-20 IEEE Computer Society, Silver Spring, MD. **EdComp-Con '83: Applying Technology to Education** Red Lion Inn, San Jose, CA.
- 19-21 Raging Bear Productions, Corte Madera, CA. **National Software Show** Trade Show Center, San Francisco, CA.
- 22 Plymouth State College, Plymouth, NH. **Conference on Computers and Education** PSC campus.
- 23-26 George Washington University Medical Center, Washington, DC. **7th Annual Symposium on Computer**

Applications in Medical Care Convention Center, Baltimore, MD.

- 24-26 American Institute of Aeronautics and Astronautics, Orlando, FL. **Computers in Aerospace Conference** Hartford, CT.
- 24-26 Association for Computing Machinery, New York, NY. **ACM '83** Sheraton Centre, New York, NY.

November

- 1-4 American Production & Inventory Control Society, Falls Church, VA. **26th Annual International Conference** Hilton Hotel, New Orleans, LA.
- 7-9 IEEE Computer Society, Silver Spring, MD. **24th Annual Symposium on Foundations of Computer Science** Tucson Marriott, Tucson, AZ.
- 10-12 Northeast Expositions Inc., Chestnut Hill, MA. **North-east Business Computer Show and Software Exposition** Hynes Auditorium, Boston, MA.

Coming Next Month

Ever feel that you're getting older while people around you stay the same? Turn the tables on them with the October *80 Micro*—there's a relativity program that tracks the time and age difference between you, traveling in a spaceship at nearly the speed of light, and a friend left behind on Earth.

The issue's theme is science, and relativity is just the beginning. Model 1/III/4 astronomers will appreciate a seasonal sky display, that shows the night sky and indicates desired targets (such as Virgo, the Big Dipper, or Polaris), and a program that keeps your telescope in sync with the Earth's daily rotation.

You shouldn't look at the sun, but we've got a program that tells its altitude and azimuth from any location at any time.

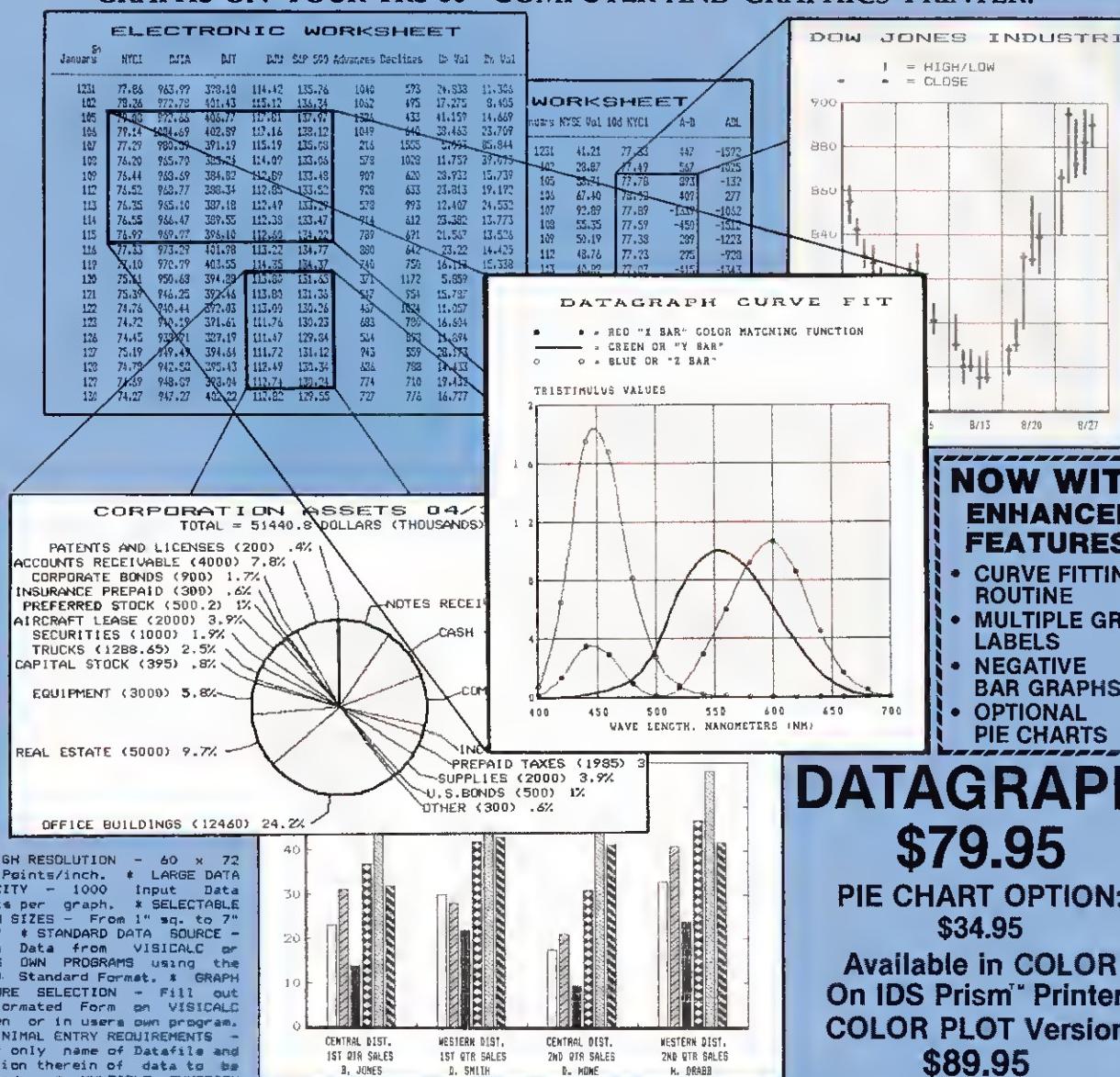
For business users, there's a business trend forecaster and a financial health analyzer. Assembly-language Model 16 programmers can study a tutorial on the 68000, and people who hate decimals can try a utility that accepts and displays numbers in fractions.

Finally, the month's game lets you take a dangerous ride on a Spacefly. Spaceflies don't approach the speed of light; in fact, as you play you may find yourself aging rapidly. ■

DATAGRAPH^{T.M.}

PRINTER
GRAPHICS
PROGRAM

TRANSFORM YOUR VISICALC™ FILES INTO HIGH-RESOLUTION CUSTOM GRAPHS ON YOUR TRS-80™ COMPUTER AND GRAPHICS PRINTER.



NOW WITH ENHANCED FEATURES:

- CURVE FITTING ROUTINE
- MULTIPLE GRID LABELS
- NEGATIVE BAR GRAPHS
- OPTIONAL PIE CHARTS

**DATAGRAPH:
\$79.95**

**PIE CHART OPTION:
\$34.95**
**Available in COLOR
On IDS Prism™ Printer:
COLOR PLOT Version
\$89.95**

USER REQUIREMENTS

COMPUTER

- TRS-80 MODEL I 48K
- TRS-80 MODEL III 48K
- LNW80 48K

DOS

- TRSDOS 1.3, 2.3
- NEWDOS, NEWDOS/80
- DOSPLUS 3.4, LDOS 5.1

DISK DRIVES

- SINGLE DRIVE (NOT TRSDOS)
- DUAL DRIVE (PREFERRED)

GRAPHICS PRINTER:

- MX-80 GRAFTRAX, OR GT+
- MX-100, FX 80/100
- LP VIII, DMP 200-2100, 120
- NEC 8023 A-C, C.ITOH 8510
- IDS 460/560, 480, 80/132
- OKIDATA 82/83 (OKIGRAPH)
- OKIDATA 92/93

TO ORDER: Send check, purchase order, or request for COD shipment. Specify Computer and Printer Type. Include \$2.50 for postage and handling. Calif. residents add 6% tax.

-526

MICRO SOFTWARE SYSTEMS • MICRO PLOT, INC.

DEALER
INQUIRIES
WELCOME

1815 SMOKEWOOD AVE. • FULLERTON, CA 92631 • (714) 526-8435

TRADEMARKS: DATAGRAPH (MICRO SOFTWARE SYSTEMS); VISICALC (VISICORP); TRS-80 (TANDY CORP); DIF (SOFTWARE ARTS INC.); PRISM (INTEGRAL DATA SYSTEMS)

VISA/MASTERCARD
ACCEPTED



The Business Of Planning

You can triumph over your business planning problems with this Monte Carlo analysis program.

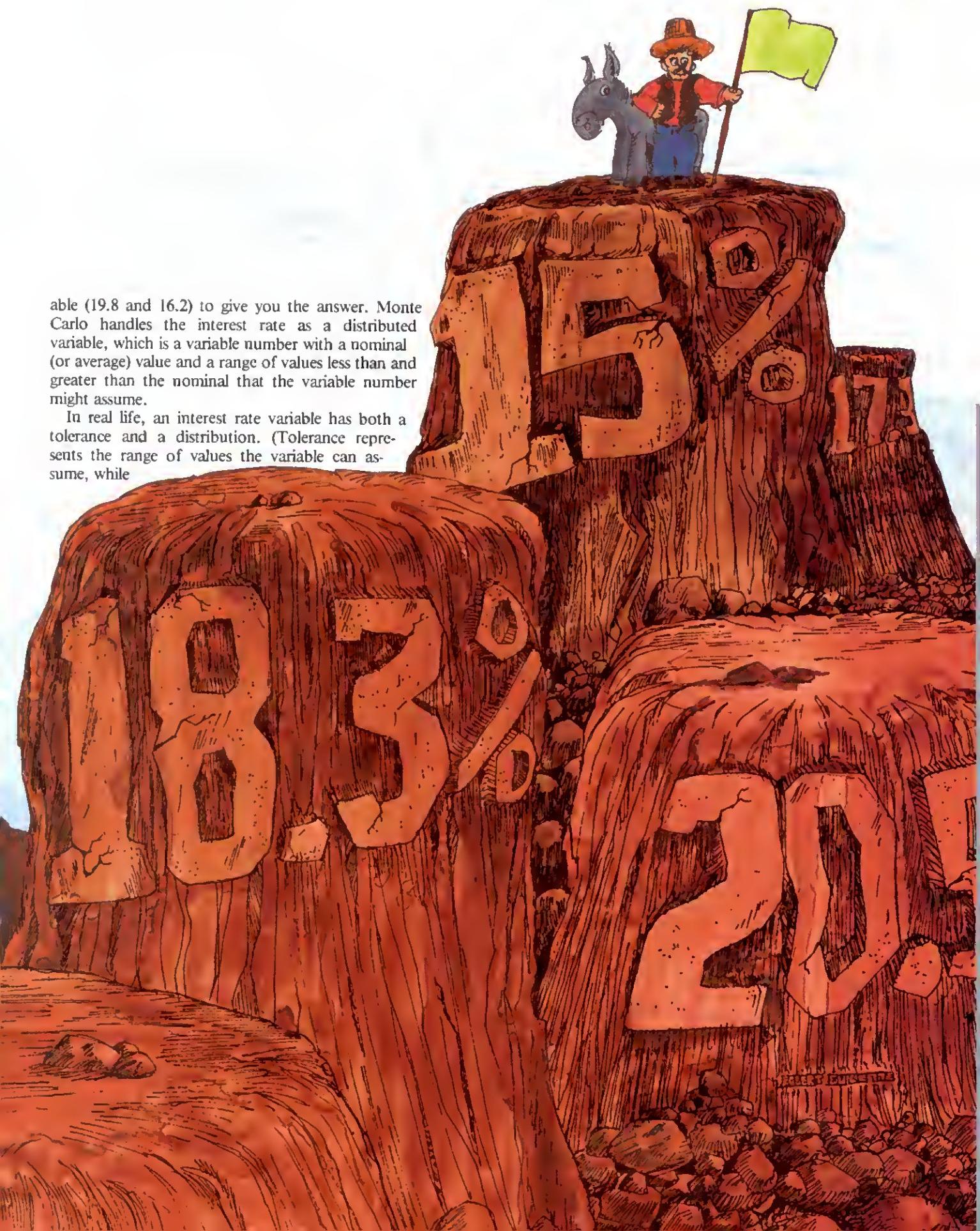
Your business is thinking about buying some capital equipment. But because you don't know what interest rates are going to do over the next three months, you're not sure how to finance it. How do you make the statistical approximations needed to let you go ahead with the purchase?

This Monte Carlo simulation can help. By using distributed variables, it will give you a more realistic scenario than worst-case analysis. And it will handle computations that are too unwieldy to do manually.

Take the above example. The interest rate is currently 18 percent. Over the next quarter, the rate might rise to 19.8 percent or fall to 16.2 percent.

A worst-case analysis would use the extremes of the vari-





able (19.8 and 16.2) to give you the answer. Monte Carlo handles the interest rate as a distributed variable, which is a variable number with a nominal (or average) value and a range of values less than and greater than the nominal that the variable number might assume.

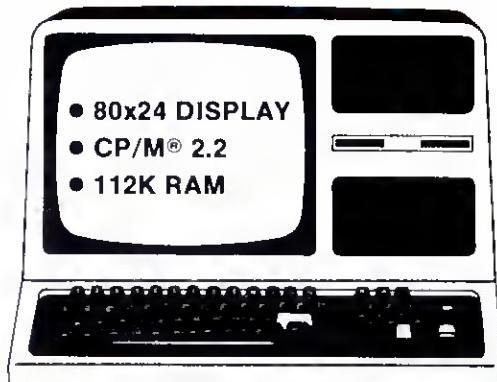
In real life, an interest rate variable has both a tolerance and a distribution. (Tolerance represents the range of values the variable can assume, while

NEW

MODEL IV FEATURES ON YOUR MODELS I and III FOR 1/2 THE PRICE

but only with . . .

The **HOLMES VID-80™**
80 character video, which includes:



FEATURES:

- Easy plug-in installation inside case.
- Software patches available for many programs.
- Improved Graphic Resolution.
- 80x24 or 64x16 selectable modes.
- CP/M® 2.2, 112K RAM. (CP/M® 3.0 4th quarter '83)

ALL OF THESE FEATURES FOR

a SPECIAL price of \$499⁰⁰

(Model III) or \$599⁰⁰ (Model I) Installed

(Includes VX-3 or VX-1, CP/M®, 64 K extended memory,
Easy Installation Instructions, & MF-2 on Model I only)

VID 80 PURCHASE ALTERNATIVES INCLUDE:

Model III VX-3 80x24 video only	\$279.50
Model I VX-1 80x24 video only	\$279.50
CP/M® 2.2 OP system (with VX-3 or VX-1 only)	\$120.00
64K RAM Extended Memory	\$125.00

NOTE: The VX-1 requires an MF-1 or MF-2 expansion Mainframe.

ORDERING INFORMATION:

- ONE YEAR WARRANTY ON ALL PRODUCTS
- Add shipping and handling
MF-1 or MF-2 \$9.00 USA, \$15.00 Canada & \$30.00 Overseas
Other products add \$5.00 U.S. & Canada all others add 15%.
- Prices subject to change without notice.
- Payment by cashiers check, money order, cash, Visa or Mastercharge - Personal checks subject to 3 week clearance.

About HOLMES ENGINEERING, INC.

- All Holmes Products come complete with easy to follow installation and trouble shooting guides and our technical group is available for support as required.
- Installation can be performed without system modifications, soldering and little or no technical background.
- MORE DETAILED PRODUCT INFORMATION IS AVAILABLE UPON REQUEST. Send a self-addressed, stamped envelope or call today for a FREE full product brochure.
- QUALITY IS BUILT INTO HOLMES PRODUCTS FROM THE START - ALL BOARDS ARE PRE-TESTED AND PROPERLY BURNED IN

TRS80 is a registered trademark of Tandy Corp., CP M is a registered trademark of Digital Research Corp.



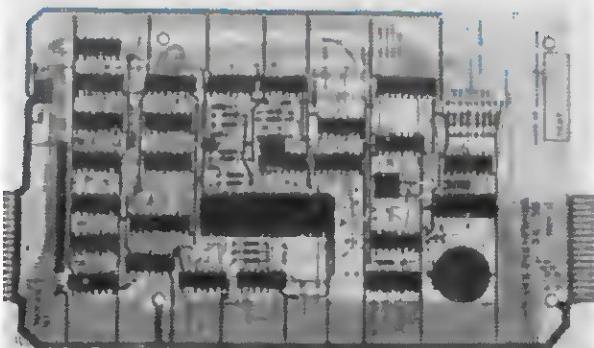
HOLMES
ENGINEERING, INC.

5175 Green Pine Drive
Murray, Utah 84107
(801) 261-5652



✓ 153

**EXPAND and UPGRADE your
Models I, III, and IV**



with Holmes . . .

Disk Controllers/Adaptors for all TRS 80® Model Computers

Double Density Adaptor DX-1D (Model I)	\$129.00
Disk Controller DX-2D (Model I requires MF-1)	\$149.95
Disk Controller w/clock DX-3DC (Model III)	\$189.95
Disk Controller w/o clock DX-3D (Model III)	\$149.95
Disk Controller w/clock DX-4DC (Model IV)	\$189.95

"DOUBLE YOUR SPEED"

CUT COMPUTER OPERATION TIME IN HALF

Sprinter II for Model I	\$99.50
Sprinter III for Model III	\$99.50
Sprinter KX 6MHz for Mod. III and IV	\$147.50

MEMORY EXPANSION

Internal Installation

Model I - IM-2 (W/32K RAM)	\$139.50
PMC-80/81 IM-2P (W/32K RAM)	\$99.50

OTHER PERIPHERALS:

Expansion Mainframe-MF-1 (For 4 boards)	\$150.00
Expansion Mainframe-MF-2 (For 2 boards)	\$99.50
Prowriter (dot matrix printer)	\$495.00
Starwriter (daisy wheel printer)	\$1,495.00
Color coded diskettes (box 10) 96 TPI	
SSDD \$29.95 DSDD \$37.95	
Epson Printer Driver	\$24.95
Drive O Package w/DX-3D, drive, power supply	\$599.00
RS232 (RX-232)	\$119.50
RS232 w/32K RAM (RX-232M)	\$199.50
Expansion Interface-Mod I (Includes DX-2D, RS232 w/32K RAM, MF-1)	\$429.00

DISTRIBUTORS:

Bi-Tech, N.Y. (800) 645-1165 · Level IV Products, MI (800) 521-3305 · Soft Sector Marketing, MI (800) 521-6504 · Digital Distributing, TX (214) 330-1332 · M&M Micro Mart, Quebec, Canada (514) 731-9486

**PLEASE CALL OR WRITE FOR AUTHORIZED
DEALER NEAREST YOU.**

DEALER INQUIRIES INVITED!

the distribution is the probability of a particular value occurring.)

Thus, while the interest might vary from 19.8 to 16.2, it's more likely to remain around the nominal, 18. You can describe this with a statistical distribution known as a normal curve (see Fig. 1).

The program randomly varies each assigned distributed variable about its nominal value according to the associated tolerance and distribution. The program calculates each variable independently, then determines an outcome by using these variables in the set of equations that defines the problem.

Monte Carlo runs many trials, records each of the results, and checks for limits. It might repeat this procedure several hundred times. Finally, the program evaluates the results of all the trials and calculates a probability to determine the answer.

Variable Types

You must define your problem within the system's constraints, using three unique types of variables to describe the environment.

Distributed variables describe a number that varies over a predictable range. Enter it in the form:

Name, Nominal Value, Plus Tolerance, Minus Tolerance, Distribution

The name is a descriptive identifier from one to six characters long. For equation calculation, the program uses it in place of the actual number.

The nominal value is the numerical base for the tolerance calculations, the number the variable will most likely assume. The plus tolerance is the percent above the nominal that you let the value reach. The minus tolerance is the percent below the nominal that you let the value reach.

The distribution ranges from zero to five and describes how close to the nominal the majority of values lie. Zero defines a flat distribution and five is a narrow distribution (see Fig. 2).

The program randomly varies the distributed variables for each Monte Carlo trial. In a worst-case analysis, the pro-

gram holds these variables at their extreme tolerances while it calculates the statistical variables. Sensitivity analysis determines the extent of the effect that the individual distributed variable has on each statistical variable.

The second category of variables, constant/calculated, has a dual purpose. You can use them as constants, variables whose values don't change, by entering them in the form:

Name, Value

Name is from one to six characters long. The program equations use it in place of the associated number. For instance, you might want to define an interest rate as: Rate, 19.2. In this case, every time the program sees Rate in an equation, it substitutes 19.2. This might be useful for documentation, although

"This program calculates two sensitivity numbers..."

you can use 19.2 directly in an equation.

This type of variable is more frequently used as an intermediate calculated variable. To use it in this form, enter the number as:

Name, 0

When the program finds this variable to the right of an equals sign in an equation, it calculates the value of the expression to the left and uses that value to replace the zero. Whenever the program encounters the name in an equation, it uses the new value.

The program uses statistical variables to calculate its statistics. Enter them in the following form:

Name, High Value, Low Value

Name is from one to six characters long and identifies the associated variable.

You set the high value as the absolute upper limit of the statistical variable. As the program calculates each value, it keeps track of how many values fall

The Key Box

Model I and III
48K RAM
Disk Basic

higher than the limit. Then it calculates the percentage of the total.

This occurs in a similar manner for the low value. In addition to the percent over and under the limits, the program calculates the standard deviation, mean value, and highest and lowest numbers found out of all trials. The program does this in turn for each variable defined as statistical.

Equations

The program's heart is in the equation definition; it does all the calculations. By using the three variable types and relating them to each other with mathematical symbols, you can simulate general systems.

The computer evaluates each equation from left to right. The operators, or mathematical symbols, have no predefined precedence, so the program evaluates the leftmost operator first and the rightmost operator last. Consequently, the equals sign must be the last mathematical symbol encountered in the equation.

For instance, assume you want to find the payback on a simple interest loan. You write the equation as follows:

Rate * Amount + Amount = Paybck

Notice the equation's syntax. It starts with a variable, followed by an operator, then another variable, and so on until the last part consists of an equals sign followed by the variable you wish to find.

You've previously defined the variables Rate and Amount. Paybck is either a constant or statistical variable; the value of the expression immediately to its left determines its value. Note the space between each variable and the fol-

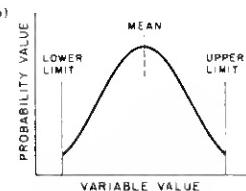
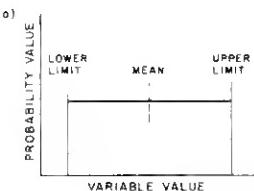


Figure 1. Uniform distribution and normal distribution.

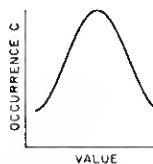
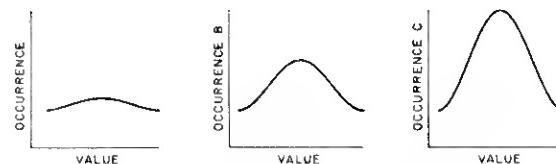


Figure 2. Distribution ranges from zero to five.

lowing operator. It lets the program distinguish correctly between the two.

Assume that Rate is a constant variable with a value of .18 (18 percent), and Amount is a constant with a value of 100. The program starts its evaluation on the left by multiplying the rate times the amount. Then it adds that sum to the previous amount. The program transfers the answer to the variable called Paybek.

The program's math operators are the four basic functions, + - * /, and five special functions:

INT TAN SIN COS ABS

The INT function truncates a floating point number to the integer portion, without a rounding operation. TAN, SIN, and COS are the standard trigonometric functions calculated in radians. The ABS function converts a number to its absolute value (makes it positive).

To take a number's sign and divide it by another, use the following equation:

SIN Number / Other = Ans

The program calculates and treats each special function and the variable

following it as a single variable.

For instance, to add a number to another number's integer, you'd use the following equation:

Num1 + INT Num2 = Ans

Notice how the program treats the function INT and the variable following it, Num2, as one variable. Only one operator (+) appears before and one operator (=) after the group.

You also have a comment function. The > character denotes the beginning of a comment. You can place it at the beginning of a line (in place of an equation), or at the end of a line (after an equation):

> This is an example of a comment
Num + Var = Ans > Here's a comment

The program ignores text following a >. Note that you need a space after the >, just like any other operator.

Entering Data

The program accepts data in one of two forms. When you first run it, the program asks whether you want to retrieve data from a disk file. If so, enter

the file name. The program reads the data from the specified file into its memory (see sidebar for the disk data format). The program normally creates this data at the end of a session.

You can also enter data from the keyboard. The program asks you to enter values for each type of variable and all equations you want the program to use.

A prompt requests the number of distributed variables you wish to enter. Don't worry if you make mistakes entering the data. The editing features let you add, change, or delete. Enter the variables one at a time until all distributed variables are in the proper form.

Next enter the number of constant or calculated variables you want to use. It helps to define the problem before you begin entering so you know how many variables you're going to need. Enter the variables in the standard form described earlier.

When you enter the statistical variables, specify a generous amount. The program uses only those input here in the statistical calculations. First enter the number of variables you'll use, then the variables themselves in the proper form.

Your last input items are the equations. The number of equations directly affects the program's cycle time; the more equations you enter, the longer it takes to finish the calculations.

For instance, if you specify 250 trials and the program takes one minute per cycle (because of the number of equations), the complete run would last around four hours. This is not unusual, due to the inherent speed of the Basic interpreter.

Comments, however, don't take up much computation time and make the equations much more readable. You should try to use highly descriptive names for the variables.

Editing

Much of the program's power and flexibility come from its editing capabilities. Once you enter your data, the program enters the edit mode. (If you enter data from the disk at start up, the program bypasses edit and asks for the number of trials.)

The first screen in this mode is an edit menu (see Fig. 10). Choose the proper group number to add, change, or delete variables or equations. When you choose a group, the information as it currently exists appears with a corresponding number on the screen. This is the data edit mode.

Choose a line number to display a

THE RESULTS ARE IN!!!

"...Your Word Machine Program is the best bargain I've found in my two years of personal computing."

"My secretary prefers the Word Machine to News-script because it's faster and easier to use..."

"...a slick package...a great manual."

**Make Your Second Word Processor
Pel-Tek's Word Machine Version 2.0**

A full featured line oriented word processor in machine language now better than ever with these features

- Block graphics (for printers that support it)
- Imbedded form controls • Help screen
- Lower case support for unmodified Mod I's
- Variable margins, line length, page length, line spacing
- Access to DOS with warm start re-entry
- Scroll up/down text • Save/load disk files
- Insert/delete characters/lines • String search
- Set up to fifteen tab stops
- Center text • Imbed codes 0-255 in line
- Insert another file into text • word-wrapping
- Edit any ASCII file (up to 80 char. lines)
- 23000 char. buffer for 48K version
- Pause for keyboard entries during printout
- Print multiple copies of text
- Printer independent • Simplified commands
- Twenty-four page typeset manual with command summary sheet (manual FREE with S.A.S.E.)

For Mod I/III 32/48K Disk. ...only \$20.00

PEL-TEK

P.O. Box 1026 • Southampton, PA 18966
TOLL FREE ORDER LINE 800-523-2445
In Pennsylvania Call (215) 947-2334

- Check or Money Order • Visa, MasterCard accepted
- Add \$2.00 per order for postage and handling
- PA residents add 6% sales tax

-324

the GOLD kit

New Life for your TRS 80 Model I

- Memory Faults?
- Programs Freezing Up?
- Worn Contacts?

The Model I is a good computer, but it is getting old. Your expensive gold connectors have to transmit data through the Mod I's worn and oxidized PC board contacts. With the GOLD KIT and fifteen minutes you can upgrade these old tin contacts to gold.



These new connectors are soldered onto the tin plated edge contacts of your computer and expansion interface. You need just a screwdriver and soldering iron.

The kit includes all six connectors and detailed instructions.

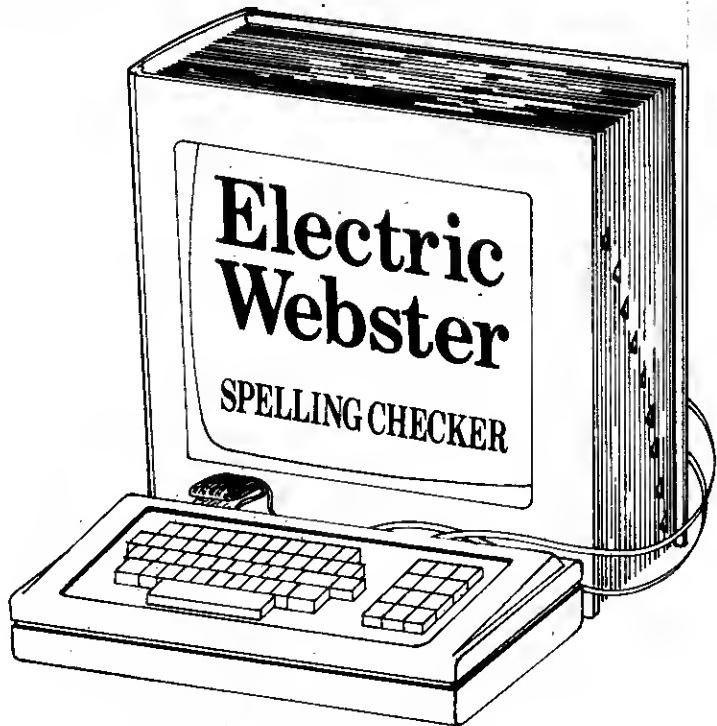
Send \$29.50 Check or Money Order to:



Wisconsin Residents add 5% sales tax.

Finally, a Spelling Checker that can SPELL!

- 50,000 Word Dictionary**
- Displays Correct Spellings**
- Hyphenates Automatically**
- Grammar & Style Checker**



INTEGRATES into 7 different word processing programs, (SuperScripsit, Scripsit, Newscrip, Lazy Writer, Electric Pencil, Copy Art, Superscript).

SINGLE KEY OPERATION: You need only press a key and in moments, Electric Webster can actually be saving, proofing, correcting and hyphenating your text—all automatically.

50K WORDS AND MANY MORE: You can view words in context, or add them to your dictionary at the stroke of a key.

VERIFIES CORRECTIONS: If you think you know the correct spelling of a word, EW will check it for you before it makes the corrections.

DISPLAYS DICTIONARY: If you don't know, EW will look up the correct spelling for you, and display the dictionary.

FAST CORRECTING: In as little as 30 seconds, Electric Webster can return you to your Word Processing program, with your text fully corrected and on your screen.

LOW PRICES

TRS-80	Electric Webster	\$ 89.95
	w/Correcting Feature	\$149.95
	Hyphenation	\$ 49.95
	Grammar & Style Checker	\$ 49.95
CP/M or MS/DOS	Electric Webster	\$209.95
	(includes Correcting Feature and Hyphenation Option)	

"The Cadillac of Spelling Checkers!"
'80 Microcomputing, September 82

"Electric Webster is the best. Just read any review in any magazine and I don't believe that you will find even one disagreement to that statement." *Cincinnati's TRS-80 Users Group, April 1983*

"Actually, Electric Webster is faster than its predecessor (Microproof) . . . and spelling corrections are immediately verified against the dictionary before being accepted . . ." *Microcomputing, September 1982*

"My spelling book is now gathering dust. Electric Webster not only checks spelling, displays words in context and corrects errors in the text, but it will also immediately take you to the right place in a 50,000 word dictionary so you can check the correct spelling for yourself." *Info World, August 1982*

"In my opinion, the perfect combination is Correcting Electric Webster with the hyphenation and grammar add-ons. To my surprise, it fills every reasonable expectation. It is fast, easy to use and accurate." *Desktop Computing, December 1982*

VOTED #1: If this sounds too good to believe, you don't need to take our word for it. Take the word of the thousands of '80 Micro readers who voted Electric Webster the #1 spelling checker. Take the word of the scores of professional software reviewers who have raved about Electric Webster. Or, ask your local computer or software dealer for a demonstration, and see for yourself!



CORNUCOPIA SOFTWARE

Post Ofice Box 6111 Albany, California 94706 • (415) 524-8098

v45

copy of the line at the bottom of the screen, and enter the line edit mode.

The arrow (cursor) appears above the text to be edited, starting at the leftmost character. By typing from the keyboard, you can overwrite characters that are in the cursor position. The program increments the cursor after each keystroke, so you can completely retype the whole line or any portion of it.

You can also move the cursor without destroying the characters it indicates. Using the left-arrow key, you move the cursor one space to the left with each depression. When the cursor is in the leftmost position, additional keystrokes have no effect. The right-arrow key moves the cursor one character to the right in the same manner.

By using shift right arrow or shift left arrow, you move the cursor immediately to the rightmost or leftmost position respectively. Two other features in the line edit mode are insert and delete.

Enter the insert mode by pressing the up-arrow key. At the cursor position, the program enters all characters you type. The line separates to let you insert without overwriting existing characters. Pressing any other edit key removes the program from the insert mode.

Use the down-arrow key to delete any character located directly under the cursor. The rest of the characters move left to fill the void created by the deletion. Successive pressing of the down-arrow key deletes multiple characters. You can also use the clear key to delete all characters from the current cursor position to the end of the line.

The last editing key is the shift up-arrow. Use it any time during the line edit mode to end editing and return to the data edit mode. The program will make no changes. This is helpful if you decide not to change a line after all. To end the line edit and save all changes, press the enter key.

The data edit mode lets you make changes, additions, or deletions to data already entered. For example, suppose that you've entered three distributed variables numbered 1, 2, and 3. To add a fourth variable between numbers 2 and 3, enter 2.5 in response to the prompt below (see Fig. 12).

Insert Line=Fraction - Delete Line=NULL -
Abort Edit = 'Enter'

This puts you into the line edit mode with all its features and lets you enter another variable. When you press return (ending the line edit mode), the variable list reappears on the screen. The program renames the list so the

line you just entered occupies line number 3, and the remaining lines are adjusted accordingly.

To delete a line, enter the number corresponding to the line you want to

delete. When you enter the line edit mode, press the clear key to erase the line, then press return.

When the program relists the data, the line is gone and the remaining lines

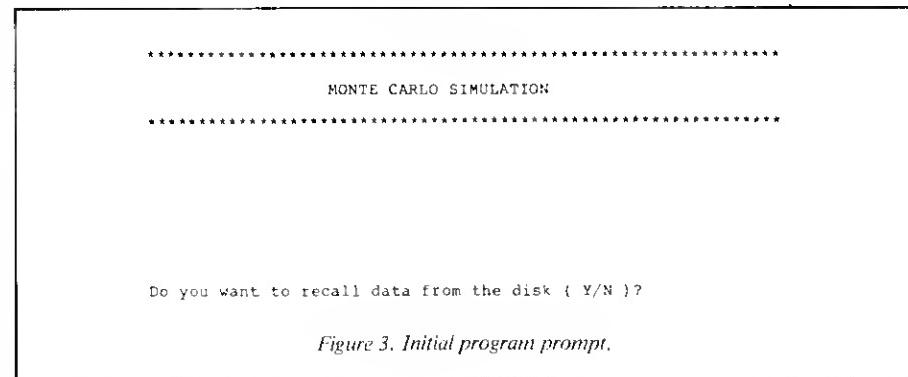


Figure 3. Initial program prompt.

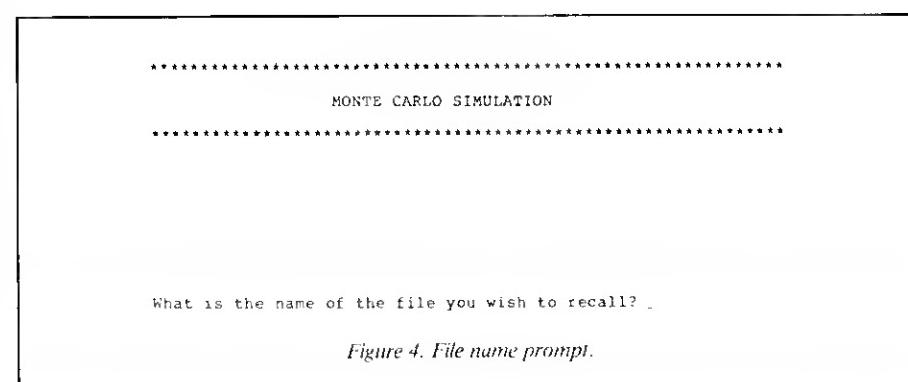


Figure 4. File name prompt.

Format of Data File

After you enter data into the program for analysis, you have the option of saving that data to disk for future use. The program stores it as a sequential file in the following order:

1. An integer value of the number of distributed variables.
2. A string value containing the name of the first distributed variable.
3. A single precision value containing the nominal value.
4. A single precision value containing the plus tolerance.
5. A single precision value containing the minus tolerance.
6. A single precision value containing the distribution value.
7. The program repeats data #2 through #6 for each distributed variable that data #1 specifies.
8. A single precision value of the number of constant variables.
9. A string variable containing the name of the first constant variable.
10. A single precision variable containing the value of the first constant variable.
11. The program repeats data #9 and #10 for each constant variable that data #9 specifies.
12. A single precision value of the number of statistical variables.
13. A string value containing the name of the first statistical variables.
14. A single precision value containing the upper limit.
15. A single precision value containing the lower limit.
16. The program repeats data #13 through #15 for each statistical variable that data #12 specifies.
17. A single precision value of the number of equations.
18. A sequential list of all the equations that data #17 specifies follows. The program stores each equation as a string variable. ■



How to chart your company's fortune without spending one

It's a fact. A single chart or graph can tell you instantly what it takes hours to interpret from printouts or other raw data.

Now, with Strobe Graphics Plotters and Software, you can create superb hardcopy graphics directly from your computer. And you can do it for a fraction of the cost of most other systems.

The Strobe System transforms complex data into dynamic, colorful visuals with a few simple commands from your computer. Charts and transparencies that once took hours to produce are plotted within minutes. Information can be presented as bar charts, pie charts, curves or isometrics using a variety of colors, character styles and symbols. And with a resolution of 500 points per inch, the Strobe plotters match or surpass the quality of plotters costing thousands of dollars more.

You can also save and modify your graphics through Strobe's menu-driven programs. A broad selection of software—including programs that plot directly from VisiCalc* and Supercalc** files—is now available.

When the Strobe Graphics System is interfaced to your computer, an 8½x11 inch sheet of paper can speak anyone's language—visually. Visit your local dealer and learn how to start charting your fortunes today. Because a perspective on the present can also be your window on the future.



>338

Strobe Inc.
897-5A Independence Avenue
Mountain View, CA 94043
Telephone 415/969-5130

The Strobe Graphics System

Seeing is believing

*VisiCalc is a trademark of VisiCorp.

**Supercalc is a trademark of Sorcim Corp.

have moved up one position.

Return to the main menu from the data edit mode by pressing return without entering a number. You can choose another category to edit or go on to the analysis portion of the program (Monte Carlo trials or sensitivity analysis).

Monte Carlo Analysis

When you press the enter key from the main menu, the program enters the Monte Carlo analysis portion of the

program. The computer randomly assigns numbers to each distributed variable within its range, then calculates the statistical variables found in each equation. This process occurs once for each trial you request.

Before the analysis begins, the program asks you how many trials you'll need. You can enter any number from zero to the numerical range of the machine. If you enter zero, the program returns to the main menu and takes no

further action.

The more trials you enter, the longer it takes to complete the analysis. The length of time required for each trial varies depending on the amount and length of the equations. You can estimate about three seconds per equation per trial. If you have 20 equations, the program would take about one minute per trial.

You should limit the number of trials to between 50 and 100 to give best results. Less than 25 will not yield accurate results.

During the course of its analysis, the program keeps you updated as to its progress. On the bottom of the screen, you see the trial number and equation currently being evaluated.

When the program completes the required number of trials, it asks if you want a printout. If you enter Y and a printer is available, the output is directed to the printer as well as the screen. The program abbreviates the screen output due to the 64-column limitation.

The program next asks you to enter a comment line. You can enter any number of characters up to 255 for the program to use as a printout title.

As the program evaluates each equation, it dynamically checks for errors. If it encounters one, it displays a message and halts evaluation (see Table 1 for a list of possible error messages).

If the program encounters an error, you should return to the edit mode and review the equation in question. Check for proper syntax, and make sure you've previously defined all variables in one of the three variable sections.

A sample of a single trial Monte Carlo run appears in Fig. 13. It contains three distributed variables, two constant variables, four statistical variables, and four equations.

The first portion of the output shows the distributed variables, their nominal values (in this case, all had the value of 10), their plus and minus tolerances (5 percent), and their distributions (ranging from DIST1, a narrow distribution, to DIST3, a flat distribution).

I set up this program's variables to directly reflect the state of the distributed variables: I set STAT1 equal to DIST1 in the program's equation section. This is one way to see what is directly happening to the distributed variable.

The printout indicates that as the distribution becomes flatter (going from STAT1 to STAT3), the value the distributed variable assumes deviates further from the nominal, 10.

```
*****  
MONTE CARLO SIMULATION  
*****  
  
There are three types of variables allowed in this program;  
1) DISTRIBUTED - These are varied for each trial depending  
on the entered tolerance.  
2) CALCULATED/CONSTANT - These are used for intermediate  
calculations and to simplify long equations.  
3) STATISTICAL - These will be tallied for each trial and a  
statistical analysis will be performed after the  
last trial.  
PRESS ANY KEY TO CONTINUE.
```

Figure 5. Display to manually enter data.

```
ENTER THE NUMBER OF DISTRIBUTED VARIABLES (< 21 )? 2  
Enter the distributed variables in the form -  
NAME,NOMINAL,+TOL,-TOL,DISTRIBUTION  
Where - 'NAME' is a string of 8 characters or less.  
'NOMINAL' is the nominal value of the variable.  
'TOLERANCE' is the per cent variation from nominal.  
'DISTRIBUTION' is 0 for flat to 5 for narrow.  
  
ENTER DISTRIBUTED VARIABLE # 1  
? _
```

Figure 6. Distributed variable prompt.

```
ENTER THE NUMBER OF CONSTANT OR CALCULATED VARIABLES (< 21 )?  
1  
Input the constant variable name (< 9 char.),  
Followed by its constant value. Enter 0 if it is to  
be calculated.  
  
VARIABLE 1 NAME,CONSTANT? _
```

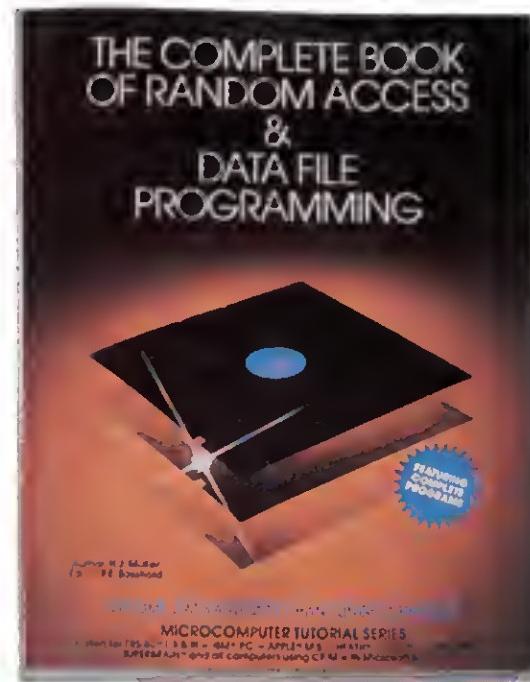
Figure 7. Constant or calculated variable prompt.

```
ENTER THE NUMBER OF STATISTICAL VARIABLES (< 21 )? 1  
STATISTICAL VARIABLES  
Input variable in the form: NAME,UPPER LIM,LOWER LIM.  
  
VARIABLE 1 ? _
```

Figure 8. Statistical variable prompt.

Learn to Program Like a Professional!

THE COMPLETE BOOK OF RANDOM ACCESS & DATA FILE PROGRAMMING



Written for TRS-80™ I, II, & III - IBM™/PC - APPLE™ M/S - OSBORNE™ - HEATH™ - DEC™ - SUPERBRAIN™ - and all Computers using CP/M with Microsoft BASIC™

The best word on disk random access and file handling techniques, this series is intended for everyone — beginning programmers, businessmen and professionals will learn how to create custom programs to handle inventories, mailing lists, work scheduling, record keeping, and many other tasks, while more experienced programmers will learn advanced, professional programming techniques for faster, more efficient data storage and retrieval.

Although random access file handling is a matter of some complexity, the subject has been treated in a simple and down-to-earth fashion, so that anyone with some small familiarity with programming in Microsoft BASIC will be able to cope with the material. Each stage of learning uses a sample program as a starting point. The programs grow in capability and complexity as the books progress into all of the various aspects of file handling and record manipulation. An extensive effort has been made to keep the material coherent and every program line is explained in detail.

Volume I BASIC FILE HANDLING

- The writing of a Menu to summarize program functions
- Screen format for data entry
- The creation of a basic record
- The FIELD and LSET routines for buffer preparation
- Disk storage of random access records
- Changing or editing stored records
- The LPRINT capability from disk using three different formats
- Sorting the random file
- Searching by name or key field
- Search in "next" or "prior" fashion
- Purging deleted records
- Using disk file data for calculations
- Future expansion of date fields
- Using flags to prevent program crashes
- Date setting, printer on-line and many other routines to make a program run like a commercially written program

VOLUME I \$29.95

Optional Vol. I Program Disk

TRS-80 Model I/III \$29.50

TRS-80 Model II \$32.50

Volume II ADVANCED FILE HANDLING TECHNIQUES

- Relational database programming
- Comprehensive self-balancing accounting system with printouts
- Hash-coded date file manipulation -- (probably the fastest method of data retrieval). Hashing the input key and recovery method explained
- Span-blocking techniques allow creation of records longer than 256 bytes without wasted space
- Blocking & Deblocking
- Shell-Metzner sort
- In-place screen editing
- Recovery of deleted record space
- Alpha-index record retrieval
- Fast machine language/BASIC sort
- Linked list record structure and sort-merge, deleted record removal and file reorganization
- Multi-key file reorganization and record searching

VOLUME II \$29.95

Optional Vol. II Program Disk

TRS-80 Model I/II/III \$49.95

COMPUTRONICS

50 N. PASCACK ROAD
SPRING VALLEY, NEW YORK 10577

NEW TOLL-FREE



DEALER INQUIRIES WELCOME

ORDER LINE
(OUTSIDE OF N.Y. STATE)

(800) 431-2818

24

HOUR
ORDER LINE

(914) 425-1535



30-DAY MONEY BACK GUARANTEE

*** ALL PRICES & SPECIFICATIONS SUBJECT TO CHANGE ***
DELIVERY SUBJECT TO AVAILABILITY

* ADD *

ADD \$3.00 FOR SHIPPING IN UPS AREAS
ADD \$4.00 FOR C.O.D. OR NON-UPS AREAS
ADD \$5.00 TO CANADA & MEXICO
ADD PROPER POSTAGE OUTSIDE OF U.S.
CANADA & MEXICO

You can also see this in the standard deviation of the statistical variable that quantitatively shows you the dispersion from the mean. The STD. DEV. increases from .14 to .18 as the distribution gets flatter.

The high and low values show the

largest and smallest numbers that the statistical variable assumes out of all the trials run. This determines how far outside the limits the variable traveled.

The limits appear under the headings Minimum and Maximum. You set these when you first enter the statistical vari-

able into the program. The percent of values outside these limits appears under the headings %Under and %Ovr.

The next section shows the equations used to calculate the statistical variables. By setting the statistical variable equal to the distributed variable, you can have the output track the distributed variable. Note that equation 1 is a comment line.

The final section shows the constants used in this example. Since STAT4 is equal to the constant, 10, the standard deviation in the statistical section is zero, showing no variation from the mean.

The statistical output consists of several numbers that describe a sample sufficiently to forecast what the whole population should look like in an infinite sample. The larger the sample size, the greater the accuracy.

The mean is the average number in the sample. The closer you get to this value, the more likely it is to occur (see Fig. 1). In a normal distribution, the mean is the curve's highest part.

As you get further from the mean, less of the population will have that value in any one trial. The standard deviation is the percentage of that population that falls in any range of numbers.

Enter the equations in the form:
VAR OPER VAR OPER VAR = VAR COMMENT
Where VAR is a previously defined variable followed by a space
and OPER consists of one of the following math operators:
+ - * / ^
or one of the following trig operators:
LOG SIN COS TAN INT
The functions are in radians and the LOG is natural. Each
operator must be followed by a space. The expression is
evaluated from the left to the right. The COMMENT is ignored.
A null equation (for comment purposes) may be entered by
starting a line with a ' > ' followed by a space.

EQUATION 1 ? _

Figure 9. Equation prompt.

Enter the number to change or input.
1 - DISTRIBUTED VARIABLES
2 - CONSTANT OR CALCULATED VARIABLES
3 - STATISTICAL VARIABLES
4 - EQUATIONS
5 - ALL
6 - SENSITIVITY ANALYSIS/WORST CASE
'ENTER' - MONTE CARLO ANALYSIS

Figure 10. Edit menu.

ATTENTION EPSON OWNERS
The ultimate solution to your paper storage
problem at an unbelievable low cost of only **\$9.95 SET**



PRINTER-STILTS™ PRINTER SUPPORTS

FEATURES:

- Precision machined from solid aluminum.
- Tilted to facilitate viewing paper.
- Soft rubber feet to absorb vibration.
- Easy to install — no tools required.
O-rings insure tight fit into printer recesses.
- Natural finish aluminum.

Available in two styles (MX-70/80 or MX-100) for your EPSON Printer. The MX-70/80 style also fits the IBM & TI PC dot matrix printers and the HP829058 printer. To order PRINTER-STILTS™ printer supports give style and send \$9.95 plus \$2.00 postage/handling or call today:
Louisiana residents add 5% tax.

DATATEK INC.

Dept. 140

P.O. Box 3954

Shreveport, La. 71135

(318) 956-2244 or 409-6696 8:30 PM CST



Why settle for less on TRS-80® Model 100 Computers & Accessories?

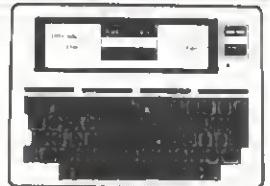
Get Service, Selection,
and Shipment . . .
not just a low price!

Sure we ship mail order,
but Computer Discount of
America is a full-service,
multi-store retail operation.
Our staff of experts is willing
and able to help you fill your
needs and get the most out of your computer.

We offer a complete variety of computers, as well as
all the popular brands of Printers, Monitors, Software,
and Accessories. All orders are shipped within
24-48 hours from the largest inventory in the Northeast,
in factory-sealed cartons.

Whether we talk to you on the phone or in person,
your satisfaction is important to us.

If you're looking for price, selection and service, call
Computer Discount of America — where the only thing
we discount is price.



**Portable Computer
Model 100** List \$999
Sale \$819
Offer good 9-1-9-30-83

ORDER TOLL FREE: 800-526-5313
COMPUTER DISCOUNT OF AMERICA, INC.
15 Marshall Hill Road, West Milford Mall
West Milford, New Jersey 07480-219
In New Jersey Call 201-728-8080

**Computer
Discount
of America**

COMPUTRONICSTM

• • EVERYTHING FOR YOUR TRS-80™ • ATARI™ • APPLE™ • PET™ • CP/M™ • XEROX™ • IBM™ • OSBORNE™ • •

* TRS-80 is a trademark of the Radio Shack Division of Tandy Corp. * ATARI is a trademark of Atari Inc. * APPLE is a trademark of Apple Corp. * PET is a trademark of Commodore

* CP/M is a trademark of Digital Research. * XEROX is a trademark of Xerox Corp. * IBM is a trademark of IBM Corp. * OSBORNE is a trademark of Osborne Corp.



BUSINESS PAC 100

100 Ready-To-Run Business Programs

(ON CASSETTE OR DISKETTE)....Includes 128 Page Users Manual....
Inventory Control....Payroll....Bookkeeping System....Stock Calculations....
Checkbook Maintenance....Accounts Receivable....Accounts Payable....

BUSINESS 100 PROGRAM LIST

NAME

DESCRIPTION

1 RULE78	Interest Apportionment by Rule of the 7's
2 ANNU1	Annuity computation program
3 DATE	Time between dates
4 DAYYEAR	Day of year a particular date falls on
5 LEASEINT	Interest rate on lease
6 BREAKEVN	Break-even analysis
7 DEPRSL	Straightline depreciation
8 DEPRSC	Sum of the digits depreciation
9 DEPRDB	Declining balance depreciation
10 DEPRDDB	Double declining balance depreciation
11 TAXDEP	Cash flow vs. depreciation tables
12 CHECK2	Prints NEBS checks along with daily register
13 CHECKBK1	Checkbook maintenance program
14 MORTGAGE/A	Mortgage amortization table
15 MULTMON	Computes time needed for money to double, triple, etc.
16 SALVAGE	Determines salvage value of an investment
17 RRVARIN	Rate of return on investment with variable inflows.
18 RRCONST	Rate of return on investment with constant inflows
19 EFFECT	Effective interest rate of a loan
20 FVAL	Future value of an investment (compound interest)
21 PVAL	Present value of a future amount
22 LOANPAY	Amount of payment on a loan
23 REGWITH	Equal withdrawals from investment to leave 0 over
24 SIMPDFSK	Simple discount analysis
25 DATEVAL	Equivalent & nonequivalent dated values for oblig.
26 ANNUIDEF	Present value of deferred annuities
27 MARKUP	% Markup analysis for items
28 SINKFUND	Sinking fund amortization program
29 BONDVAL	Value of a bond
30 DEPLETE	Depletion analysis
31 BLACKSH	Black-Scholes options analysis
32 STOCVAL1	Expected return on stock via discounts dividends
33 WARVAL	Value of a warrant
34 BONDVAL2	Value of a bond
35 EPEST	Estimate of future earnings per share for company
36 BETAALPH	Computes alpha and beta variables for stock
37 SHARPE1	Portfolio selection model i.e. what stocks to hold
38 OPTWRITE	Option writing computations
39 RTVAL	Value of a right
40 EXPVAL	Expected value analysis
41 BAYES	Bayesian decisions
42 VALPRINF	Value of perfect information
43 VALADINF	Value of additional information
44 UTILITY	Derives utility function
45 SIMPLEX	Linear programming solution by simplex method
46 TRANS	Transportation method for linear programming
47 EOQ	Economic order quantity inventory model
48 QUEUE1	Single server queueing (waiting line) model
49 CVP	Cost-volume-profit analysis
50 CONDPROF	Conditional profit tables
51 OPTLOSS	Opportunity loss tables
52 FQUOQ	Fixed quantity economic order quantity model
53 FQEOWSH	As above but with shortages permitted
54 FQEOPQB	As above but with quantity price breaks
55 QUEIECB	Cost-benefit waiting line analysis
56 NCFANAL	Net cash-flow analysis for simple investment
57 PROFIND	Profitability index of a project
58 CAPI	Cap Asset Pr. Model analysis of project

59 WACC	Weighted average cost of capital
60 COMPBAL	True rate on loan with compensating bal. required
61 DISCBL	True rate on discounted loan
62 MERGANAL	Merger analysis computations
63 FINRAT	Financial ratios for a firm
64 NPV	Net present value of project
65 PRINDLAS	Laspeyres price index
66 PRINDPA	Paasche price index
67 SEASIND	Constructs seasonal quantity indices for company
68 TIMETR	Time series analysis linear trend
69 TIMEMOV	Time series analysis moving average trend
70 FUPRINF	Future price estimation with inflation
71 MAILPAC	Mailing list system
72 LETWRIT	Letter writing system-links with MAILPAC
73 SORT3	Sorts list of names
74 LABEL1	Shipping label maker
75 LABEL2	Name label maker
76 BUSBUD	DOME business bookkeeping system
77 TIMECLK	Computes weeks total hours from timeclock info.
78 ACCTPAY	In memory accounts payable system-storage permitted
79 INVOICE	Generate invoice on screen and print on printer
80 INVENT2	In memory inventory control system
81 TELDIR	Computerized telephone directory
82 TIMUSAN	Time use analysis
83 ASSIGN	Use of assignment algorithm for optimal job assign.
84 ACCTREC	In memory accounts receivable system-storage ok
85 TERMSPAY	Compares 3 methods of repayment of loans
86 PAYNET	Computes gross pay required for given net
87 SELLPR	Computes selling price for given after tax amount
88 ARBCOMP	Arbitrage computations
89 DEPRSF	Sinking fund depreciation
90 UPSZONE	Finds UPS zones from zip code
91 ENVELOPE	Types envelope including return address
92 AUTOEXP	Automobile expense analysis
93 INFSFILE	Insurance policy file
94 PAYROLL2	In memory payroll system
95 DILANAL	Dilution analysis
96 LOANAFFD	Loan amount a borrower can afford
97 RENTPRCH	Purchase price for rental property
98 SALELEAS	Sale-leaseback analysis
99 RRCONVBD	Investor's rate of return on convertible bond
100 PORTVAL9	Stock market portfolio storage-valuation program

- TRS-80 Cassette Version
- TRS-80 (Mod-I or III), Pet, Apple or Atari Versions
- TRS-80 Mod-II, IBM, Osborne and CP/M Versions

ADD \$3.00 FOR SHIPPING IN UPS AREAS
ADD \$4.00 FOR C.O.D. OR NON-UPS AREAS
ADD \$5.00 TO CANADA AND MEXICO
ADD PROPER POSTAGE OUTSIDE OF U.S., CANADA AND MEXICO

\$99.95 NEW TOLL-FREE ORDER LINE (OUTSIDE OF N.Y. STATE)
\$99.95 (800) 431-2818
\$149.95

COMPUTRONICS
MATHEMATICAL APPLICATIONS SERVICE

50 N. PASACK ROAD
SPRING VALLEY, NEW YORK 10977
ASK FOR OUR 64-PAGE CATALOG
DEALER INQUIRIES INVITED

AMERICAN EXPRESS
24 HOUR ORDER LINE
(914) 425-1535
Master Charge
VISA
ALL PRICES & SPECIFICATIONS SUBJECT TO CHANGE
DELIVERY SUBJECT TO AVAILABILITY

You can assume that about 68 percent of the population will lie plus or minus one standard deviation from the mean; 95 percent will lie plus or minus two standard deviations, and 99.9 percent will lie plus or minus three standard deviations. This assumes a sufficiently large sample size.

The high and low values with the corresponding minimum and maximum limits are self-explanatory. When you

use them in conjunction with the statistical descriptors, you can make a good estimation of a problem's outcome.

During the output of the statistical data, the program asks if you want graphical output. If you answer yes, it produces a small bar graph for each statistical variable.

Figure 13 is a sample of a run with a graphical output. The first of the two columns left of the bar graph is labeled

Range. It starts at the value chosen for the variable Minimum value, and ends with the value chosen for the variable Maximum value. Range is divided into 10 equal groups.

The next column, labeled Number, contains the number of trials during which the variable fell into the corresponding range group. The bar graph itself consists of a normalized graph of the results. To the graph's right are the pertinent corresponding statistical results.

Examine the results of the first statistical variable, STAT1, in Fig. 13. The minimum/maximum range chosen for this variable is 9.5 to 10.5. The graph's first line, labeled 9.5, contains all values that fall below but don't equal 9.5. The next line of the graph, labeled 9.6, contains all values equal to and greater than 9.5, but less than 9.6.

This continues for 10 equal groups until you reach the final number, 10.5. The first line labeled 10.5 contains all values equal to and greater than 10.4, but less than 10.5. The last line labeled 10.5 contains all values 10.5 or greater.

The lowest value calculated in this run is 9.66. In the graph, only one value (9.66) fell in the 9.7 category. The graph itself is normalized to 15—the largest number of values out of all categories assumes a value of 15. The program scales all other categories from this value.

Notice that range 10.1 of variable STAT1 contains 27 values. The number 27 also appears on the graph's top border, indicating that the longest line shown (consisting of 15 asterisks) contains 27 values. The next largest cate-

#	NAME	NOMINAL	+ TOL	- TOL	DIST
1	DIST1	10	.05	.05	5
2	DIST2	10	.05	.05	3
3	DIST3	10	.05	.05	0

DIST2, 10, .05, .05, 3

Figure 11. Line edit mode of distributed variable 2.

#	NAME	NOMINAL	+ TOL	- TOL	DIST
1	DIST1	10	.05	.05	5
2	DIST2	10	.05	.05	3
3	DIST3	10	.05	.05	0

ENTER THE NUMBER OF THE LINE TO EDIT/DELETE?
INSERT LINE=FRACTION - DELETE LINE=NULL - ABORT EDIT='ENTER'

Figure 12. Prompt to add a variable.

SMALL
SOFTWARE
SYSTEM

TRIMTEK CO

SMALL
SOFTWARE
SYSTEM

NEW! — RSM3 FOR MOLS I—II—III and 4!!

IMPROVED versions of the popular RSM-2D monitor available exclusively through TRIMTEK CO.—RSM3-x retains all of the popular RSM-2D commands. An all new Editor modifies memory or disk in HEX or ASCII. Forward, Reverse and Split-screen scrolling. Multiple Break Points. Read/Write disk sectors single or double density etc. Runs anywhere in memory. On special self booting disk. Transfers to any Dos. RSM3-IV written for MDL 4.80 character screen.

RSM3-I \$29.95 (single density only) With DD patch \$39.95
RSMII — \$39.95 RSM3-III — \$34.95 RSM3-IV — \$39.95

TRS232 PRINTER INTERFACE — A low cost software driven output port to any RS232 serial printer. Also drives model-33 110 baud teletypes. Plugs into cassette port on Mds 1, 3 or 4. No tools required. Does not interfere with cassette operation. Drivers for the TRS232 are already included in many software packages including the new IJG version of ELECTRIC PENCIL.

TRS232 with standard driver software (cassette) \$59.95

FORMATTER - "Smart" driver software for TRS232 \$14.95

— Add \$2.50 for Shipping & Handling. Foreign \$5.00 —

EDIT YOUR ROM

L2-SUB Mdl 1—Substitute your EPROMS for ROMS. A direct replacement for the LEVEL-II board (please specify two or three ROMS). A forth socket is decoded at 300OH (the 2K omitted by RS) for your own custom 2716 EPROM or the RSM-1P monitor listed below. L2-SUB \$49.95

L2-SUB PLUS—Extends L2-SUB's extra socket capabilities to 8K in 2K port selected increments, by allowing up to four custom 2716s.

L2-SUB PLUS \$49.95

RSMP-I MONITOR ON A CHIP!—A mini-version of the SSS Mdl 1 Monitor. In the L2-SUB fourth socket, RSMP-I is as available as basic. RSMP-I \$34.95

POOR MAN'S EPROM PROGRAMMER—PMEP-x—Economical EPROM Programmer for Mds 1, 3 or 4. Programs 2716, 2532, 2732, 2764 & 27128. Please specify Computer Mdl.

PMEP-1 thru 4 \$79.95

Complete documentation accompanies all TRIMTEK/SMALL SYSTEM SOFTWARE products.

Calif Residents Add 6 1/2% State Tax

BOX 5028-A 1000 OAKS CA. 91360



(213) 889-8142



467

gory (range 10) contains 21 values that correspond to 12 asterisks (the integer value of 21 divided by 27 times 15).

By normalizing the graph in this manner, you keep the number of values always in scale. To the graph's right is the statistical data for the variable previously presented in the statistics output.

Since the range always starts with the minimum value specified for the variable and ends with the maximum value, judiciously select this range during the statistical variable input.

If the range is too large (minimum equal to zero and maximum equal to 100) and the actual high/low values are much closer together (e.g., low value equal to 47.2 and high value equal to 48.9), the resulting graph is meaningless.

You can't change the range after you've run the Monte Carlo simulation and keep the accumulated data intact. If the range is too large, you must begin the trials over again. I recommend that you first execute a trial run of only one or two trials to gauge the magnitude of the statistical variable value.

To reinforce the concept of the statistical variable distribution, you can use the graphical output shown in Fig. 13. Notice that DIST1 (equal to STAT1) has a distribution of five, DIST2 (equal to STAT2) has a distribution of three, and DIST3 (equal to STAT3) has a distribution of zero.

Notice the relative differences in the graphical output of the corresponding statistical variables. STAT1 ranges from 9.7 to 10.3 in a fairly narrow grouping. STAT2 has a broader distribution (more evenly grouped) from 9.7 to 10.5, while STAT3 is a relatively flat grouping from 9.6 to 10.5.

Sensitivity Analysis

You enter the program's sensitivity portion by choosing item 6 from the main edit menu (see Fig. 10). The sensitivity analysis determines the degree to which a particular distributed variable affects any one statistical variable.

For instance, if your equation relates a statistical variable to one distributed variable and one calculated variable, and the calculated variable relates in turn to two other distributed variables, it's difficult to determine which of the distributed variables has the greatest effect on the equation.

The sensitivity analysis places a quantitative measurement on each distributed variable as it relates to each statistical variable. This lets you easily ascertain its contribution to the overall statistical value.

Mechanically, the program operates much as it did for the Monte Carlo analysis: It must make several passes through each equation, varying a different value each time. However, the program individually assigns each variable its worst case tolerance value instead of random values.

The first pass sets each distributed

variable at its nominal value. The screen shows a trial number of zero as the program calculates each equation.

Then the program begins by setting the first distributed variable to its maximum positive tolerance, leaving all other distributed variables at their nominal values. This appears on the screen as trial 1 to indicate that the program is

INITIAL VALUES						
PART	NOMINAL VALUE	+TOLERANCE	-TOLERANCE	DISTRIBUTION		
DIST1	10	.05	.05	5		
DIST2	10	.05	.05	3		
DIST3	10	.05	.05	0		
STATISTICS						
NUMBER OF TRIALS = 100						
VARIABLE	MEAN	STD.DEV.	HIGH VAL	LOW VAL	MINIMUM	% UNDER
STAT1	9.98	.27	10.27	9.66	9.5	0
STAT2	10.02	.44	10.43	9.63	9.5	0
STAT3	10.01	.44	10.49	9.51	9.5	0
STAT4	10	0	10	10	9.5	0
RANGE	NUMBER	.....1.....!	27!	VARIABLE	STAT1	
9.5	0	!		LOWEST VALUE	9.66	
9.6	0	!		HIGHEST VALUE	10.27	
9.7	1	!*		MEAN VALUE	9.98	
9.8	11	*****		STD DEVIATION	.27	
9.9	17	*****		NO. OF TRIALS	100	
10	21	*****				
10.1	27	*****				
10.2	20	*****				
10.3	3	!*				
10.4	0	!				
10.5	0	!				
		.....1.....!	....1....!			
RANGE	NUMBER	.....1.....!	24!	VARIABLE	STAT2	
9.5	0	!		LOWEST VALUE	9.63	
9.6	0	!		HIGHEST VALUE	10.43	
9.7	3	!*		MEAN VALUE	10.02	
9.8	8	*****		STD DEVIATION	.44	
9.9	7	*****		NO. OF TRIALS	100	
10	24	*****				
10.1	24	*****				
10.2	19	*****				
10.3	14	*****				
10.4	0	!				
10.5	1	!*				
		.....1.....!	....1....!			
RANGE	NUMBER	.....1.....!	13!	VARIABLE	STAT3	
9.5	0	!		LOWEST VALUE	9.51	
9.6	8	*****		HIGHEST VALUE	10.49	
9.7	9	*****		MEAN VALUE	10.01	
9.8	11	*****		STD DEVIATION	.44	
9.9	10	*****		NO. OF TRIALS	100	
10	12	*****				
10.1	11	*****				
10.2	8	*****				
10.3	10	*****				
10.4	8	*****				
10.5	13	*****				
		.....1.....!	....1....!			
RANGE	NUMBER	.....1.....!	100!	VARIABLE	STAT4	
9.5	0	!		LOWEST VALUE	10	
9.6	0	!		HIGHEST VALUE	10	
9.7	0	!		MEAN VALUE	10	
9.8	0	!		STD DEVIATION	0	
9.9	0	!		NO. OF TRIALS	100	
10	100	*****				
10.1	0	!				
10.2	0	!				
10.3	0	!				
10.4	0	!				
10.5	0	!				
		.....1.....!	....1....!			
EQUATIONS USED:						
1 > EQUATIONS TO SHOW DISTRIBUTIONS						
2 DIST1 = STAT1						
3 DIST2 = STAT2						
4 DIST3 = STAT3						
5 CON1 + CON2 = STAT4						
VARIABLES/CONSTANTS						
1 CON1	0					
2 CON2	10					

Figure 13. Sample Monte Carlo run.

SENSITIVITY ANALYSIS

STATISTICAL VARIABLE = STAT1		NOMINAL VALUE = 10		STATISTICAL VARIABLE = STAT2		NOMINAL VALUE = 10	
DISTRIB VARIABLE	STATISTICAL RELATIVE SENSITIVITY	ACTUAL SENSITIVITY	STATISTICAL RELATIVE SENSITIVITY	ACTUAL SENSITIVITY	DISTRIB VARIABLE	STATISTICAL RELATIVE SENSITIVITY	ACTUAL SENSITIVITY
DIST1	10.5	1	5	9.5	-1	-5	
DIST2	10	0	0	10	0	0	
DIST3	10	0	0	10	0	0	
STATISTICAL VARIABLE = STAT3		NOMINAL VALUE = 10		STATISTICAL VARIABLE = STAT4		NOMINAL VALUE = 10	
DISTRIB VARIABLE	STATISTICAL RELATIVE SENSITIVITY	ACTUAL SENSITIVITY	STATISTICAL RELATIVE SENSITIVITY	ACTUAL SENSITIVITY	DISTRIB VARIABLE	STATISTICAL RELATIVE SENSITIVITY	ACTUAL SENSITIVITY
DIST1	10	0	0	10	0	0	
DIST2	10.5	1	5	9.5	-1	-5	
DIST3	10	0	0	10	0	0	
STAT VARIABLE	NOMINAL VALUE	POSITIVE SENSITIVITY	WORST CASE	NEGATIVE SENSITIVITY			
STAT1	10	10.5		9.5			
STAT2	10	10.5		9.5			
STAT3	10	10.5		9.5			
STAT4	10	10		10			

Figure 14. Sample sensitivity analysis.

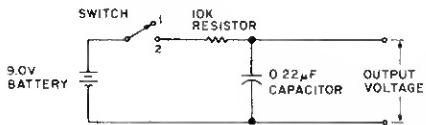


Figure 15. Electronic circuit schematic.

varying the first distributed variable.

As the program works on each equation, it records the value of each statistical variable. It then compares this value to the value of the statistical variable calculated when all variables were

"The program's heart is in the equation definition..."

nominal. In this manner, the program makes a quantitative analysis on each individual distributed variable.

Next, the program returns the first distributed variable to its nominal value and proceeds to the second distributed variable. Trial 2 appears on the screen to inform you of the program's progress. This process continues until the program has tested all distributed variables.

At this point, the program shows only the positive effect of the distributed variables. It now repeats the process, varying each distributed variable to its maximum negative tolerance. A minus sign precedes the trial number corresponding to the number of the distributed variable currently being calculated.

The program's last type of calculation is the worst-case analysis. In this mode, it again varies each distributed variable to its maximum tolerance; however, all variables charge at the same time.

The program uses the data accumulated during the first part of the analysis to determine which variation (maximum positive or negative tolerance) yields the worst case value for each statistical variable. This process occurs for the worst case positive and worst case negative situations.

This program calculates two sensitivity numbers, relative and actual. The actual sensitivity is a ratio of the percent change in the function's value to the overall change in the element or variable causing that change. The relative sensitivity is a ratio of the percent change in the function to the percent change in the variable.

In the equation $V * 5 / 10 = STAT$, assume that the variable V has a nominal value of 25 with a tolerance of plus and minus 5 percent. Now, you can calculate the actual sensitivity of the variable V with respect to the variable $STAT$.

The program first calculates the nominal value of $STAT$, or 12.5 ($25 \times 5 / 10$). Then it varies V to its maximum positive tolerance, 26.25 (1.05×25). Next, the program recalculates the equation using the new value for V to arrive at the answer, 13.125 ($26.25 \times 5 / 10$).

Then the program subtracts the nominal value from the new value, divides the result by the nominal, and multiplies by 100 to obtain the percent of change. The actual sensitivity in this example is

ELECTRONIC CIRCUIT ANALYSIS INITIAL VALUES							
PART	NOMINAL VALUE	+TOLERANCE	-TOLERANCE	DISTRIBUTION			
RES	10000	.1	.1	3			
CAP	2.2E-07	.5	.2	2			
STATISTICS							
NUMBER OF TRIALS = 20							
VARIABLE	MEAN	STD.DEV.	HIGH VAL	LOW VAL	MINIMUM	% UNDER	MAXIMUM
TIME	9E-04	9E-04	1.3E-03	7E-04	8E-04	5	1E-03
RANGE	NUMBER	1.....1.....1	201	VARIABLE	TIME		
8E-04	1	1****		LOWEST VALUE	7E-04		
8.2E-04	2	1*****		HIGHEST VALUE	1.3E-03		
8.4E-04	3	1*****		MEAN VALUE	9E-04		
8.6E-04	2	1*****		STD DEVIATION	9E-04		
8.8E-04	0	1		NO. OF TRIALS	20		
9E-04	1	1****					
9.2E-04	4	1*****					
9.4E-04	1	1****					
9.6E-04	1	1****					
9.8E-04	1	1***					
1E-03	1	1***					
1E-03	3	1*****					
		1.....1.....1					
EQUATIONS USED:							
1 > ELECTRICAL CIRCUIT EXAMPLE							
2 VOLT / BATT = RATIO							
3 1 - RATIO = CVOLT							
4 0 - LOG CVOLT * RES * CAP = TIME							
VARIABLES/CONSTANTS							
1 RATIO	.333333						
2 CVOLT	.666667						
3 BATT	9						
4 VOLT	3						

Figure 16. Electronic circuit analysis.

WORDSTAR®

TRS 80

THE CONNECTION HAS BEEN MADE

6249.00

```

140      ' INITIALIZATION
150      CLEAR 5000
170      DEFINT C-E,I-O,P,X,Y: DEFSTR B
170      DV=0
180      DEF PNB(X)=STRINGS(ABS(X-PEEK(16539)),",","")
190      DV=20
200      DIM ES(64) ' EDITING STRING
210      DIM QU(DV,4),RA(DV,2),VA(DV,0),ST(DV,0),ME(DV),SI(DV)
220      DIM SP(DV,DV),SN(DV,DV),NO(DV), SENSITIVITY ARRAYS (USED FOR
WRST CASE & PLOTTING)
230      DIM MAS(6),FUS(5) MATH & FUNCTION ARRAYS
240      DIM VS(DV,2), - VARIABLE NAMES
250      DIM SS(DV), - STATISTICAL VAR NAMES
260      DIM LS(DV,2), - EQUATIONS
270      D1=0 ' DEBUG FLAG
280      DE=0 ' DEBUG FLAG
290      D3=0 ' DEBUG FLAG (EQUATION FINAL VALUE)
300      FOR X=1TO6 ' MATH FUNCTIONS
310      READ MAS(X)
320      NEXT
330      DATA [,*,/,+,-,
340      FOR X=1TO5 ' TRIG FUNCTIONS
350      READ FUS(X)
360      NEXTX
370      DATA LOG,SIN,COS,TAN,INT
380      'FIRST SCREEN
400      CLS
410      PRINT STRINGS(63,"*");PRINT,PRINTTAB(10);"MONTE CARLO SIMULA
TION."
420      PRINT,PRINTSTRINGS(63,"*")
430      ' GET DATA FROM DISK
440      PRINT@896,"Do you want to recall data from the disk ( Y/N )?
"; 
450      GOSUB 9060 ' INPUT Y/N RESPONSE
460      IF AS="N" THEN 2900 ' INPUT NEW DATA
470      '-----'
480      ' READ OLD DATA
490      PRINT@896,"What is the name of the file you wish to recall";
500      INPUT FS:IF LEN(FS)<>0 THEN 520
510      GOSUB 9140:GOTO490
520      FS=LEFT$(FS,8)+"/ITA"
530      GOSUB9100
540      ON ERROR GOTO 10240
550      ER=0
560      OPEN "I",1,FS
570      IF ER<>0 THEN 510
580      PRINT@896,"READING FILE ";FS;
590      RE=1
600      GOSUB 650 'GET DATA
610      RE=0
620      GOTO 850 'EDIT ROUTINE
630      '-----'
640      ' SUBROUTINE TO READ OR WRITE DATA
650      IF RE THEN INPUT#1,D ELSE PRINT#1,D
660      FOR X=1TO100
670      IF RE THEN INPUT#1,V$(X),QU(X,1),QU(X,2),QU(X,4),QU(X,3)
ELSE PRINT#1,V$(X);",",QU(X,1),QU(X,2),QU(X,4),QU(X,3)
680      NEXTX
690      IF RE THEN INPUT#1,C ELSE PRINT#1,C

```

LNGPQ continued

+ 5 percent. A 5 percent change in V yields a 5 percent change in STAT.

However, if V has a nominal value of 25 with a plus and minus tolerance of 10 percent, the actual sensitivity is 10 percent because it's a measure of the function's overall change.

On the other hand, you use the relative sensitivity for a comparison between two variables. It's a measure of a percent change's effect in the variable, not overall change. The program divides the actual sensitivity value (5 percent) by the variable tolerance (5 percent) to obtain the relative sensitivity (1 percent).

Even if the function's overall change increases by 10 percent, the relative sensitivity remains at 1 percent. This determines which variable is most sensitive to change regardless of its tolerance.

Figure 14 is a sample printout of sensitivity analysis results. The example's data is the same as that in the Monte Carlo analysis printout. The printout's first line lists the variable the program is currently examining, along with its nominal value. This occurs for each statistical variable.

Next are headings to describe the data. One column is for the distributed variable. The next column indicates statistical value (the value the statistical variable assumes when the program takes

the corresponding distributed variable to its extreme), relative sensitivity, and actual sensitivity for both positive and negative cases.

In the first case, STAT1, the statistical variable was sensitive only to variable DIST1 because DIST1 is the only variable involved in the equation with STAT1 (DIST1 = STAT1). When the program varies DIST1 by 5 percent, it also varies STAT1 by 5 percent, as the actual sensitivity value indicates.

Note that the percent change in the statistical variable for a percent change in the distributed variable (relative sensitivity) is 1 percent. This follows for the minus tolerance as well.

You can see the same kind of results for the corresponding distributed variables in the other cases, with the notable exception of STAT4. In STAT4, none of the distributed variables affected the statistical variable in the associated equation 10 = STAT4.

While the sensitivity analysis shows the effect of varying one distributed variable while keeping the others constant, the worst-case analysis varies all the distributed variable to create the worst possible condition. This occurs for both the worst positive and worst negative conditions.

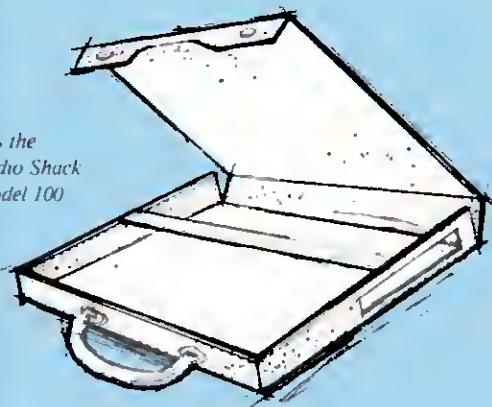
The results of this calculation follow

```

700 FOR X=D+1 TO 0+C
710 IF RE THEN INPUT#1,V$(X),RA(X) ELSE PRINT#1,V$(X);",",RA(X)
720 NEXTX
730 IF RE THEN INPUT#1,S ELSE PRINT#1,S
740 FOR X=1 TO S
750 IF RE THEN INPUT#1,SS$(X)'ST(X,7)'ST(X,1)
ELSE PRINT#1,SS$(X);",",ST(X,7);ST(X,1)
760 NEXTX
770 IF RE THEN INPUT#1,E ELSE PRINT#1,E
780 FOR X=1 TO E
790 IF RE THEN INPUT#1,L$(X) ELSE PRINT#1,L$(X)
800 NEXTX
810 CLOSE
820 RETURN
830
 840   EDIT ROUTINE
850 CLS
860 PRINT"Enter the number to change or input."
870 PRINT" 1 - DISTRIBUTED VARIABLES"
880 PRINT" 2 - CONSTANT OR CALCULATED VARIABLES"
890 PRINT" 3 - STATISTICAL VARIABLES"
900 PRINT" 4 - EQUATIONS"
910 PRINT" 5 - ALL"
920 PRINT:PRINT" 6 - SENSITIVITY ANALYSIS/WORST CASE"
930 PRINT" 'ENTER' - MONTE CARLO ANALYSIS"
940 PRINT
950 AS=INKEY$:IF AS="" THEN 950
960 N=VAL(AS)
970 IFN=0 THEN 3830 'START TRIALS
980 ON N GOSUB 1020,1680,2150,2570,3100,7500
990   EDIST,ECON,ESTAT,ECU,START_SENS
1000 GOTO850
1010   EDIST
1020 CLS
1030 PRINT" *; " NAME,"NOMINAL","+ TOL";TAB(42);"- TOL";TAB(52)
1040 )"DIST"
1040 A1=X=D:FOR A=1 TOO
1050 PRINTA;TAB(5);V$(A),QU(A,1),QU(A,2);TAB(42);QU(A,4);TAB(52)
;QU(A,3)
1060 GOSUB2910' SCREEN CHK
1070 NEXTA
1080 A1=D
1090 LI=D:GOSUB8950:D=LI' INPUT CHANGE SUBROUTINE (INUM)
1100 IFA=0 THEN RETURN
1110 IF A>AL THEN D=A1
1120 IF (A>AL AND D>DV) OR (A>INT(A) AND D>DV) THEN 1020
1130 IF A>AL THEN GOSUB 1960' SHIFTC
1140 IF A>AL THEN O=A:E$=""':GOTO1170' ADD A LINE
1150 IF A<>INT(A) AND A<AL THEN GOSUB 1430:E$=""':GOTO1170' SHIFT
D
1160 ES=V$(A)+"+STR$(QU(A,1))+", "+STR$(QU(A,2))+", "+STR$(QU(A,
4))+", "+STR$(QU(A,3))
1170 GOSUB 9250' EDIT STRING
1180 GOSUB 1350' SEPARATE STRING
1190 IF ER=1 THEN GOSUB 1560:GOTO1020' DDOWN (Delete line)
1200 V$(A)=ELS
1210 IF ER=2 THEN 1020' Partial String
1220 GOSUB 1350
1230 QU(A,1)=VAL(E1$)
1240 IF ER=2 THEN 1020
1250 GOSUB 1350
  
```

AVAILABLE NOW!

Fits the
Radio Shack
Model 100



Artist Concept, Style may change slightly

\$109.99.

Made by Bianchi Leather Products
of fine top-grade high quality leather.

A beautiful HARD LEATHER
carrying/protective case
for your Model 100 Computer

*The best insurance available for
only 10% of your initial investment*

YES! Send me a LEATHER CASE
for my Model 100 Computer
@\$109.99 each Check M.O.
Include 6% State Tax/Calif.
Res. & \$3.00 for Shipping & Handling.

Name _____

Address _____

City _____ Zip _____

ALPHA 100

P.O. Box 112, 161 N. Main Street, Lake Elsinore, Ca. 92330

Unconditional Guarantee

PRO FOOTBALL

The Gold Edition

POINTSPREAD PREDICTION SYSTEM



AVAILABLE FOR:
 APPLE
 TRS-80 MODEL I & III
 IBM PC

THE GOLD EDITION

THE MOST SOPHISTICATED SYSTEM EVER DESIGNED
 FOR THE PREDICTION OF PRO FOOTBALL POINTSPREADS

If you're looking for a PROFESSIONAL pro football prediction system, then take a look at THE GOLD EDITION. THE GOLD EDITION is the most sophisticated pro football pointspread prediction system ever designed. THE GOLD EDITION is not a game — its recommended only for the serious pro football handicappers. From weeks 6 to 16 during the 1980 and '81 seasons THE GOLD EDITION has been a proven WINNER IN ALL CATEGORIES over the Las Vegas Line:

SEASON	FAVORITES		UPSETS		TOTAL		TOTAL GAMES
	HOME	AWAY	HOME	AWAY	HOME	AWAY	
1981 SEASON:	57%	80%	63%	70%	59%	71%	154
1980 SEASON:	53%	67%	70%	66%	61%	66%	154
TWO YEAR AVG:	55%	73%	66%	68%	60%	68%	308

THE GOLD EDITION ALSO FEATURES....

- Completely Menu Driven Screens
- Easy to Use Commands
- Accesses One or Two Disk Drives
- Requires Only 10-15 Minutes to Update
- Includes Two Seasons of Data
- Can be Used Year After Year
- Predicts Real or Hypothetical Games
- Predicts Accurate Pointspreads
- Predicts Accurate Over/Under Scores
- Can Generate 20-35 Pages of Analysis Weekly
- Hardcopy Reports Include....
- Full Season Schedule
- Team Performance Detail Analysis
- Team Performance Summary Analysis
- YTD Divisional Standings
- Computer Prediction Analysis
- Pointspread Differential Graphing
- Over/Under Differential Graphing

STOP GAMBLING.....THE GOLD EDITION provides the highest quality of information necessary to beat the Las Vegas Line. Retail price includes THE GOLD EDITION System Diskette, Data diskette with two years of data, and over 100 pages of comprehensive documentation with padded leather-like binding

\$199.50

SDL

2612 ARTESIA BLVD., SUITE B
 REDONDO BEACH, CA 90278
 (213) 374-4471

-366



Listing continued

```

1260 QU(A,2)=VAL(E$):IF QU(A,2)>=1 THEN QU(A,2)=QU(A,2)/100
1270 IF ER=2 THEN 1020
1280 GOSUB 1350
1290 QU(A,4)=VAL(E$):IF QU(A,4)>=1 THEN QU(A,4)=QU(A,4)/100
1300 IF ER=2 THEN 1020
1310 QU(A,3)=VAL(E$)
1320 GOTO 1020
1330 ,
1340 ' SEPARATE STRING
1350 ER=0:L=LEN(E$)
1360 IF L=0 THEN ER=1:RETURN
1370 X=INSTR(E$, ",")
1380 IF X=0 THEN ER=2:E$=E$:RETURN
1390 E$=LEFT$(E$,X-1):E$=RIGHT$(E$,L-X)
1400 RETURN
1410 ,
1420 ' SHIFTED SUBROUTINE
1430 GOSUB 1960:SHIFTIC
1440 A=INT(A)+1
1450 FOR X=D TO A STEP -1
1460 VS(X+1)=VS(X)
1470 QU(X+1,1)=QU(X,1) ' NOMINAL
1480 QU(X+1,2)=QU(X,2) ' + TOL
1490 QU(X+1,4)=QU(X,4) ' - TOL
1500 QU(X+1,3)=QU(X,3) ' DISTR
1510 NEXTX
1520 D=D+1
1530 RETURN
1540 ,
1550 ' DDOWN SUBROUTINE
1560 FOR X=A TO D-1
1570 VS(X)=VS(X+1)
1580 QU(X,1)=QU(X+1,1)
1590 QU(X,2)=QU(X+1,2)
1600 QU(X,4)=QU(X+1,4)
1610 QU(X,3)=QU(X+1,3)
1620 NEXTX
1630 Y=0
1640 GOSUB 2000:CDOWN
1650 D=D-1
1660 RETURN
1670 ,
1680 CLS: ECON
1690 PRINT " NAME", "CONSTANT"
1700 A=0:X=D+C:FOR A=D+1 TO D+C
1710 PRINTA-D,TAB(3);VS(A),RA(A)
1720 GOSUB2910: SCREEN CHK
1730 NEXTA
1740 A1=C
1750 LI=C:GOSUB2950:C=LI
1760 ,
1770 IF A=0 THEN RETURN
1780 IF (A<>INT(A)) AND ((C)>DV) THEN 1600
1790 Y=INT(A)+1
1800 IF (A<>INT(A)) AND (A>A1) THEN E$="":A=A+D:GOTO1040: ADD A LINE
1810 IF A>A1 THEN E$="":A=A+D:GOTO1040: ADD A LINE
1820 A=A+D
1830 E$=VS(A)+" "+STRS(RA(A))
1840 GOSUB 9250: EDIT STRING
1850 GOSUB 1350
1860 IF ER=1 THEN 1900

```

Listing continued

PART	NOMINAL VALUE	+TOLERANCE	-TOLERANCE	DISTRIBUTION				
VARCOST	4	.01	.1	5				
VOLUME	10000	.2	.2	0				
STATISTICS								
NUMBER OF TRIALS = 10								
VARIABLE	MEAN	STD.DEV.	HIGH VAL	LOW VAL	MINIMUM	% UNDER	MAXIMUM	% OVER
PROFIT	7997.98	2121.38	10072.4	6442	5000	0	10000	10
RETURN	59.95	17.92	181.44	28.84	25	8	100	10
RANGE	NUMBER	1.....1.....1.	201	VARIABLE	PROFIT			
5000	0	!		LOWEST VALUE	6442			
5500	0	!		HIGHEST VALUE	10072.4			
6000	0	!		MEAN VALUE	7997.98			
6500	1	*****		STD DEVIATION	2121.38			
7000	2	*****		NO. OF TRIALS	10			
7500	1	*****						
8000	2	*****						
8500	1	*****						
9000	0	!						
9500	1	*****						
10000	1	*****						
10000	1	*****						
		!.....1.....1.....1!						
RANGE	NUMBER	1.....1.....1.	201	VARIABLE	RETURN			
25	0	*****		LOWEST VALUE	28.84			
32.5	1	*****		HIGHEST VALUE	181.44			
40	2	!		MEAN VALUE	59.95			
47.5	0	*****		STD DEVIATION	17.92			
55	2	*****		NO. OF TRIALS	10			
62.5	2	!						
70	0	!						
77.5	0	!						
85	0	*****						
92.5	1	*****						
100	1	*****						
100	1	!						
		!.....1.....1.....1!						
EQUATIONS USED:								
1	PRICE - VARCOST * VOLUME = PROFIT							
2	PROFIT / INVEST - 1 * 100 = RETURN							
VARIABLES/CONSTANTS								
1	PRICE	4.75						
2	INVEST	5000						

Figure 17. Rate of return analysis.

the sensitivity data. The printout shows each statistical variable, its nominal value, and worst case values.

Example Problems

Type in the listing (or load the program from Load 80), and save it to disk. You need to access only one file during the course of the program, and you don't need upper memory space. The program runs under any Radio Shack equivalent Disk Basic.

Load the program under file name Monte/BAS. When the program runs, the screen in Fig. 3 should appear. Since you haven't saved any data to disk yet, answer N to the question: Do you want to recall data from the disk (Y/N)? After reading the brief instructions, you can begin to enter data.

The first example is a simple electronic circuit problem (see the schematic in Fig. 15). The component on the far left is a battery, connected in series with a switch and resistor.

When the switch is in position 2 (closed), it lets current flow through the resistor and charge up the capacitor (far right) to the battery voltage according to a formula. How long it takes to achieve a certain voltage depends on

Continued on p. 102

```

1870 VS(A)=E1$           1880 IF ER<>2 THEN RA(A)=VAL(E$)
1890 GOTO1680
1900 Y=A-D
1910 GOSUB 2080 '-CDOWN
1920 C=C-1
1930 GOTO1680
1940 '
1950   SHIFTC SUBROUTINE
1960   Y=1
1970 GOTO 1990
1980 A=INT(A)+1' SHIFT SUB
1990 A1=A-1', INC C ON RETURN
2000 FOR X=D+C TO D+Y STEP -1
2010 VS(X+1)=VS(X)
2020 RA(X+1)=RA(X)
2030 NEXTX
2040 RETURN
2050 '
2060 'CDOWN SUB
2070 Y=1
2080 FOR X=D+Y TO D+C-1' CDOWN SUB
2090 VS(X)=VS(X+1)
2100 RA(X)=RA(X+1)
2110 NEXTX
2120 RETURN
2130 '
2140   ESTAT
2150 CLS
2160 PRINT" #,NAME", "UPPER", "LOWER"
2170 A1=0:X=S:FOR A1=ITOS
2180 PRINTA:TAB(5):SS(A),ST(A,7),ST(A,1)
2190 GOSUB2910. SCREEN CHK
2200 NEXTA
2210 AI=S
2220 LI=S:GOSUB0950:S=LI
2230 IF A=0 THEN RETURN
2240 IF (A<>INT(A)) AND (S>=DV) THEN 2150
2250 IF (A<>INT(A)) AND (A<AI) THEN GOSUB 2390:E$="" :GOTO2280'-S
HIFTS
2260 IF A>AI THEN E$="" :GOTO2280' ADD A LINE
2270 ES=SS(A)+"+",STR$ST(A,7)+"+",STR$(ST(A,1))
2280 GOSUB 9250. EDIT STRING
2290 GOSUB 1350
2300 IF ER=1THEN GOSUB2480:GOTO2150'-SDOWN
2310 SS(A)=E1$ 
2320 IF ER=2THEN2150
2330 GOSUB 1350
2340 ST(A,7)=VAL(E1$)
2350 IF ER=2THEN2150
2360 ST(A,1)=VAL(E$)
2370 GOTO 2150
2380 '
2390 A=INT(A)+1' SUB SHIFTS
2400 FOR X=S TO A STEP -1
2410 SS(X+1)=SS(X)
2420 ST(X+1,7)=ST(X,7)
2430 ST(X+1,1)=ST(X,1)
2440 NEXTX
2450 S=S+1
2460 RETURN
2470 '

```

TURN YOUR COLOR COMPUTER ON TO THE POWER OF FLEX

NOW FROM THE WORLD'S LARGEST SUPPLIER OF SOFTWARE FOR THE FLEX OPERATING SYSTEM COMES FHL COLOR FLEX. JUST LOOK AT THESE FEATURES:

**IF YOU ARE TIRED OF
NO DISK SOFTWARE,
THEN FHL COLOR FLEX
IS THE ANSWER!**

FLEX is the world's most popular operating system for the 880s and with over 150 programs we are the largest supplier of serious software for FLEX. These programs range from word processors thru business applications to software development tools.

Many Fortune 500 companies use our software. FHL Color FLEX turns your Color Computer into a powerful system more capable than systems costing several times as much.

FHL is a trademark of Technical Systems Consultants, Inc.

THE REGENCY TOWER • SUITE 215
770 JAMES ST. • SYRACUSE, NY 13203
PHONE (315) 474-7556 • TELEX 645740



FLEX NOW ONLY \$29.95

- NEW "Ted" Tiny Editor
- NEW "ISM" Tiny Assembler
- NEW - Machine language monitor
- Hi-Res screen formats - 16 x 32, 24 x 61 upper and lower case, 24 x 64 and 32 x 64 upper case
- Advanced disk I/O and terminal capabilities supporting 35, 40 and 80 columns or double sided, single or double density drives
- No additional hardware required

**SPECIAL:
FHL
COLOR FLEX
ONLY
\$69.95**

FHL FRANK HOGG LABORATORY

```

calculations and to simplify long equations."
```

```

3050 PRINT" 3) STATISTICAL - These will be tallied for each trial
1 and a"
3060 PRINT"
statistical analysis will be performed after
the"
3070 PRINT"
ast trial."
3080 GOSUB 9120 'WAIT TO CONT
3090   ' ENTER VARIABLE AND EQUATIONS
3100 CLS:PRINT"ENTER THE NUMBER OF DISTRIBUTED VARIABLES ( <"DV+
1" )";:INPUTD
3110 IF D>DV THEN CLS:GOTO3100
3120 IF D=0 THEN CLS:GOTO3300
3130 PRINT:PRINT"Enter the distributed variables in the form -"
3140 PRINT:PRINT" NAME,NOMINAL,+TOL,-TOL,DISTRIBUTION"
3150 PRINT:PRINT"Where - 'NAME' is a string of 8 characters or
less."
3160 PRINT" 'NOMINAL' is the nominal value of the variab
le."
3170 PRINT" 'TOLERANCE' is @ for flat to 5 for narrow
ominal."
3180 PRINT" 'DISTRIBUTION' is @ for flat to 5 for narrow
"
3190 FOR A=1TO 0
3200 PRINT@768,"ENTER DISTRIBUTED VARIABLE #";A
3210 INPUTVS(A),QU(A,1),QU(A,2),QU(A,3)
3220 PRINT@768,CHR$(31);
3230 VS(A)=LEFT$(VS(A),B)
3240 IF QU(A,2)>=1THEN QU(A,2)=QU(A,2)/100
3250 IF QU(A,4)>=1 THEN QU(A,4)=QU(A,4)/100
3260 IF QU(A,3)<0 OR QU(A,3)>5 THEN PRINT@960,"DISTRIBUTION MUST
BE BETWEEN 0 AND 5";GOTD3200
3270 NEXTA
3280 "
3290 GOSUB 9120:CLS 'WAIT TO CONT
3300 PRINT"ENTER THE NUMBER OF CONSTANT OR CALCULATED VARIABLES
( <"DV+1" )";:INPUTC
3310 IF C>DV THEN CLS:GOTO3300
3320 IF C=0 THEN 3460
3330 PRINT:PRINT"Input the constant variable name ( < 9 char. ),",
3340 PRINT"Followed by its constant value. Enter @ if it is to"
3350 PRINT"be calculated."
3360 FOR A=D+1 TO D+C
3370   * * * * *
3380 "
3390 PRINT@768,CHR$(31);"VARIABLE ";A-D;" NAME,CONSTANT";
3400 INPUT VS(A),RA(A)
3410 NEXTA
3420 GOSUB 9120
3430 GOTO 3460
3440 "
3450 "
3460 CLS:PRINT"ENTER THE NUMBER OF STATISTICAL VARIABLES ( <"DV+1
"
3470 INPUT S
3480 IF S>DV THEN 3460
3490 IF S=0 THEN CLS:GOTO3590
3500 PRINT"
3510 PRINTTAB(30);"STATISTICAL VARIABLES"
3520 PRINT"
```

```

3520 PRINT"Input variable in the form: NAME,UPPER LIM,LOWER LIM.
3530 INPUT" "FOR A=1 TO S
3540 PRINT@760,CHR$(30); "VARIABLE ",A;
3550 INPUT SS(A),ST(A,7),ST(A,1)
3560 NEXTA
3570 GOSUB9120:CLS
3580 PRINT"ENTER THE NUMBER OF EQUATIONS";
3600 INPUT E
3610 IF E>2*OV THEN CLS:GOTO3590
3630 ,
3640 CLS
3650 PRINT"Enter the equations in the form:""
3660 PRINT"VAR OPER VAR OPER VAR = VAR COMMENT"
3670 PRINT"Where VAR is a previously defined variable followed b
y a space"
3680 PRINT"and OPER consists of one of the following math operat
ors: "
3690 PRINTTAB(22),"+" "- "*" "/"
3700 PRINT"or one of the following trig operators: "
3710 PRINTTAB(20),"LOG SIN COS TAN INT"
3720 PRINT"The functions are in radians and the LOG is natural.
Each"
3730 PRINT"operator must be followed by a space. The expression
is"
3740 PRINT"evaluated from the left to the right. The COMMENT is
ignored."
3750 PRINT"A null equation (for comment purposes) may be entered
by"
3760 PRINT"starting a line with a ' > ' followed by a space."
3770 FOR X=1 TO E
3780 PRINT@96,CHR$(30); "EQUATION ",X;
3790 INPUT LS(X)
3800 LS(X)=LS(X)+"
3810 NEXTX
3820 GOSUB9120:CLS
3830 INPUT "ENTER THE NUMBER OF TRIALS";NU
3840 IF NU=0 THEN B50 ' EDIT
3850 PRINT@96,"MONTE CARLO ANALYSIS";
3860 PRINT@96,"TRIAL # 1";
3870 'STATISTICS INITIALIZATION
3880 FOR A=1TO5
3890 ST(A,2)=0, * BELOW LOWER LIM
3900 ST(A,3)=-1E9, HIGHEST
3910 ST(A,4)=1E9, LOWEST
3920 ST(A,5)=0, SUM
3930 ST(A,6)=0, SUM OF SQUARES
3940 ST(A,0)=0, * ABOVE UPPER LIM
3950 SM(A,0)=-1E9:SM(A,13)=1E9
3960 FORX=1TO13
3970 SPA,X)=0
3980 NEXTX
3990 SM(A,1)=ST(A,1):SM(A,12)=ST(A,7) ' SET UP RANGE
4000 Z=ST(A,7)-ST(A,1)/10
4010 FORY=2TO11
4020 SMA,Y)=SM(A,Y-1)+Z
4030 NEXTY
4040 NEXTA
4060 FOR TR=1 TO NU

```

```

4070 GOSUB9500 ' RANDOMIZE SUB
4080 ,
4090 GOSUB 4140 ' CALC VARIABLES
4100 IF ER THEN GOTO50, EDIT
4110 GOTO4490
4120 ,
4130 'CALCULATE REMAINING VAR
4140 FOR A=1TO5
4150 PRINT@96,CHR$(30); "TRIAL # ";TR;TAB(15); "EQUATION # ";A;
4160 LS=LS(A)
4170 PR$="+
4180 AN=0
4190 ' MAINLOOP
4200 GOSUB5740; GETVAR
4210 IF ER=0 THEN 4260
4220 IF ER=2 AND PR$="+" THEN 4260
4230 IF ER=2 THEN 4440 IGNORE COMMENT
4240 ,
4250 GOSUB 6550:RETURN' ERROR
4260 GOSUB 7010, CALC
4270 IF ER=0 THEN 4300
4280 ,
4290 GOSUB 6550:RETURN
4300 IF DE=0 THEN 4330
4310 PRINT"ANS=";AN
4320 PRINT"VPRES=";VP
4330 IF DV THEN 4370, CHCK FOR DONE
4340 PR$=OPS
4350 GOTO 4200
4360 , MAINDONE
4370 IF D3=0 THEN 4440
4380 PRINT"FINAL VALUE OF ";
4390 IF ST=0 THEN 4420
4400 PRINT$IN); " IS ";VA(IN)
4410 GOTO4430
4420 PRINT$IN); " IS ";RA(IN)
4430 GOSUB 6550
4440 NEXT A
4450 RETURN
4460 ,
4470 DO STATISTICS
4480 ,
4490 GOSUB 8720 ' STAT
4500 ,
4510 NEXT TR
4520 GOSUB 9860 ' CLEANUP
4530 ,
4540 ' PRN
4550 PRINT@96,CHR$(31); " Do you want a hard copy ( Y/N ) ? ";
4560 GOSUB 9660
4570 IF A$="Y" THEN PR=1 ELSE PR=0
4580 INPUT"Enter a comment line";CS
4590 CLS:IF PR THEN LPRINT CHR$(27);CHR$(14), ' DOUBLE WIDTH
4600 L=LEN(CS)
4610 PRINTTAB((64-L)/2);CS, CENTER TITLE
4620 IF PR THEN LPRINT TAB((64-L)/2);CS
4630 PRINTTAB(25);INITIAL VALUES"
4640 IF PR THEN LPRINTTAB(25);INITIAL VALUES"
4650 PRINT
4660 IF PR THEN LPRINT" "
4670 PRINT"PART";TAB(15); "NOMINAL VALUE";TAB(33); "+TOLERANCE"; TA

```

MicroPrice SPECIALS OF THE MONTH!

INTRODUCING THE IMPROVED LNW 80 MODEL II ... AT AN UNBELIEVABLE PRICE!



This computer has it all! TRS-80™ Model I and CP/M® software compatibility with two operating systems; DOSPLUS 3.4 and CP/M 2.2. The LNW 80 MOD II can read and write the 5 1/4" disk formats of several CP/M computers including: OSBORNE, KAYPRO, XEROX 820, CP/M 86 as well as standard 8" IBM format. Standard features: 96K of RAM, parallel and serial ports, cassette and joystick ports, RGB and Composite Color interfaces, HI-RES graphics and much more! Six month warranty.

~~\$1995.~~

SYSTEM SPECIAL!

Amazing price on the
EAGLE III Computer ... **\$3499.**

System includes: 10 Megabyte hard disk and one double sided floppy disk drive, 32 preprogrammed function keys for word processing, word processing (Spellbinder), financial analysis (Ultracalc), CP/M 2.2, CBASIC.

Optional Software:

Accounting Plus \$2000.

SAVE \$1225! **\$775.**

SOFTWARE SPECIALS!

SUPER™ \$244.95

Data base management system.

• 13 times faster than dBASE II™, this is the most powerful, easy to use DBMS program that we have seen! For TRS-80 and CP/M.

THE FINANCIAL PLANNER \$479.

• New from Ashton-Tate, this is the strongest financial modeling tool available language available.

INFOSTAR \$387.

• New from MicroPro®, now you can write custom applications with plain English and edit your reports with WORDSTAR!

THE BOTTOM LINE

STRATEGIST \$295.

• New from Ashton-Tate, this is the finest econometric tool available for developing financial and marketing strategies.

PRINTER SPECIALS!



New TOSHIBA P13S0 dual mode printer
• 100 CPS letter quality and 160 CPS draft quality \$1595.

C. ITOH F10 40 CPS • bi-directional daisy wheel printer \$1379.



New SEIKO GX-100 • 50 CPS dot matrix printer with built-in tractor feed \$244.95

*This is a Price Breakthrough!

OKIDATA 83A \$669.

• 120 CPS dot matrix printer with tractor feed.

PROWRITER parallel
10" \$469.
PROWRITER parallel
15" \$679.
EPSON MX-100 \$649.

MicroPrice

We're the helpful, friendly computer wholesalers that sell direct to users by mail only. No showrooms. No toll-free numbers. Just the best prices you'll find anywhere.

All prices quoted are cash discounted prices. We also honor Mastercard, Visa, American Express and Company purchase orders.

ACCESSORY SPECIALS!

LNW 5 1/4" doubler \$159.

LNW 5 1/4" doubler with

DOSPLUS 3.4 \$175.

LNW expansion II \$329.

TEC DISK DRIVES:

5 1/4" double density drives w/case & power supply \$245.

MITSUBISHI DISK DRIVES:

2 thin line drives in one case

w/power supply —

3.2 MEG OF STORAGE! \$995.

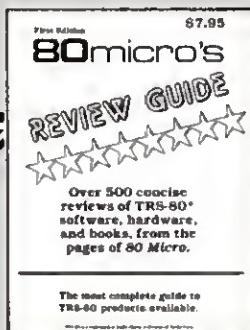
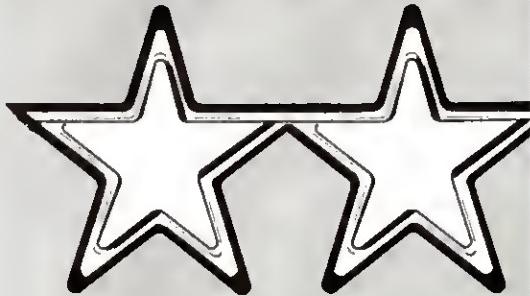
MicroPrice
1100 EAST HECTOR STREET
CONSHOHOCKEN, PA 19428
215-664-5383

```

B(45) :- "TOLERANCE";TAB(56);"DISTRIB";
    4680 IF PR THEN LPRINT"PART";TAB(15);"NOMINAL VALUE";TAB(30);"-+"
    OLERANCE;TAB(42);"-TOLERANCE";TAB(54);"DISTRIBUTION";
    4690 PRINT STRINGS(63,"-"); IF PR=1 THEN LPRINT STRINGS(66,"-")
    4700 FOR X=1 TO D
    4710 PRINTTAB(X);TAB(10);QU(X,1);TAB(16);QU(X,2);TAB(4B);QU(X,4);
    TAB(59);QU(X,3)
    4720 IF PR THEN LPRINTTAB(X);TAB(18);QU(X,1);TAB(33);QU(X,2);TAB(
    45);QU(X,4);TAB(56);QU(X,3)
    4730 NEXTX
    4740 IF PR=0 THEN GOSUB 6500:CLS
    4750 IF PR THEN LPRINT" "
    4760 PRINTTAB(25);"STATISTICS"
    4770 IF PR THEN LPRINTTAB(25);"STATISTICS"
    4780 PRINT
    4790 IF PR THEN LPRINT" "
    4800 PRINT"NUMBER OF TRIALS = ";NU
    4810 IF PR THEN LPRINT"NUMBER OF TRIALS = ";NU
    4820 "
    4830 PRINT
    4840 IF PR THEN LPRINT" "
    4850 PRINT"VARIABLE";TAB(11);"MEAN";TAB(19);"STD. DEV. ";TAB(30);"
    HIGH VAL";TAB(40);"LOW VAL";TAB(50);"%UNDR";TAB(50);"%OVR"
    4860 IF PR THEN LPRINT"VARIABLE";TAB(10);"MEAN";TAB(18);"STD. DEV
    ";TAB(27);"HIGH VAL";TAB(36);"LOW VAL";TAB(15);"MINIMUM";TAB(54
    );"UNDER";FNB(63);"MAXIMUM";
    4870 IF PR THEN LPRINT FNB(72);%"OVER"
    4880 PRINT STRINGS(63,"-"); IF PR=1 THEN LPRINT STRINGS(60,"-")
    4890 ST(X,2) ST(X,2)/NU*100
    4900 PRINTS(X,TAB(11);ME(X);TAB(19);SI(X);TAB(30);ST(X,3);TAB(
    40);ST(X,4);TAB(50);ST(X,2);TAB(58);ST(X,9)
    4930 IF PR THEN LPRINTS(X);TAB(9);ME(X);TAB(18);SI(X);TAB(27);S
    T(X,3);TAB(36);ST(X,4);TAB(45);ST(X,1);TAB(54);ST(X,2);FNB(63);S
    T(X,7);FNB(72);ST(X,0)
    4940 NEXTX
    4950 IF PR=0 THEN GOSUB 6500
    4960 PRINT@960,CHR$(30);Do you want a graphic output (Y/N) ?
    4970 GOSUB960;IF A$<>"Y"THEN CLS:Goto5320
    4980 "
    4990 CLS'GRAPHIC STATISTICAL OUTPUT
    5000 FORX=1TO5:PRINT:PRINT RANGE*TAB(10)"NUMBER"TAB(17)"1.....1...
    .1."
    5010 IF PR=1 THEN LPRINT" ";LPRINT"RANGE"TAB(10)"NUMBER"TAB(17)
    .1...1....1.
    5020 L=0:FORZ=T012:IFSP(X,Z)>L THEN L=SP(X,2)
    5030 NEXTZ:Z=L/15:L=NU*100:PRINT USING"###";L;:PRINT"1":IF PR=1
    THEN LPRINT USING"##";L;:LPRINT"1"
    5040 FORY=1TO12:PRINTSM(X,Y);TAB(10):SP(X,Y);TAB(17);"1";
    5050 IF PR=1 THEN LPRINTSM(X,Y);TAB(10);SP(X,Y);TAB(17);"1";
    5060 PRINTSTRINGS(SP(Y),Y)/Z+.5;"*")>;
    5070 IF PR=1 THEN LPRINTSTRINGS(SP(X,Y)/Z+.5;"*");
    5080 ONGOSUB5120,5150,5170,5190,5210,5230,5250,5250,5
    250,5250
    5090 NEXTX
    5100 PRINTTAB(17)"!....!....!....!""
    5110 IF PR=1 THEN LPRINTTAB(17)"1....1....1....1"
    5120 GOTO5270
    5130 PRINTTAB(30)"VARIABLE"TAB(52);SS(X)
    5140 IF PR=1 THEN LPRINTTAB(30)"VARIABLE"TAB(52);SS(X)

```

THIS IS IT



80 MICRO's REVIEW GUIDE

The guide that will save you time and money. You'll spend more time at your computer and less money for the right product.

80 Micro's Review Guide is the most comprehensive collection of TRS-80* reviews ever compiled in book form. You get 500 hardware, software and book reviews packed with information about:

- Modems
- Games
- Word processing and business programs
- Joysticks
- Books on programming
- Printers
- Utilities
- Editor/Assemblers
- Educational software
- Monitors
- Databases and more.

Don't waste valuable time chasing down the right product. We've done it for you with 80 Micro's Review Guide, compiled and condensed from the pages of 80 Micro, the magazine you've come to rely on.

A five-star rating system lets you decide what's best. And each review gives you the product manufacturer's information so you can order and receive your product fast.

All for \$7.95

**Order now. Use the attached order form,
or the coupon, or call toll free
1-800-258-5473.**

YES,

I want to save time and money.
Send me 80 MICRO's REVIEW GUIDE today.

KORG9

Please send me _____ Review Guides at \$7.95 each and add \$1.50 per book shipping and handling.

Check enclosed MC VISA AE

Card# _____

Exp. Date _____

Signature _____

Name _____

Address _____

City _____

State _____ Zip Code _____

Wayne Green Inc. • 80 Pine St. • Peterborough, NH 03458 • Attn: Marcia Stone

Please allow 6-8 weeks for delivery.

```

5700 PRINT"FILE SAVED"
5710 CLOSE:ER0
5720 ' SUBROUTINE TO GET A VALUE FROM LS
5730 ER=0
5740 IF OP=0 THEN 5770
5750 PRINT"GETVAR SUB :PRINT
5760 GOSUB 6120
5770 IF ER=0 THEN 5840' CONT1
5780 IF ER=2 THEN RETURN' IGNORE COMMENT
5790 PRINT"NO SPACE FOUND AFTER VARIABLE (*;LEFT$(L$,1,1);") IN EQUATION " ;A;
5810 RETURN
5820 '
5830 ' CHECK FOR RESERVED TRIG FUNCTIONS
5840 OP=0' CONT1
5850 FOR X=1 TO 5
5860 IF T0$=U$(X) THEN OP=X
5870 NEXTX
5880 IF OP=0 THEN 6100' CONT2
5890 IF 01 THEN PRINT"TRIG FUNCTION ENTERED":PRINT
5900 GOSUB 6420' GETOKEN
5910 IF ER THEN 5000' SPACE ERROR
5920 GOSUB 6666' EVAL
5930 IF ER THEN RETURN
5940 ON OP GOTO 5960,5980,6020,6030
5950 ' LOG
5960 T0=LOG(T0):GOTO6040
5970 ' SINE
5980 T0=SIN(T0):GOTO6040
5990 ' COSINE
6000 T0=COS(T0):GOTO6040
6010 ' TANGENT
6020 T0=TAN(T0):GOTO6040
6030 T0=INT(T0)
6040 IF 01=0 THEN 6200
6050 PRINT"FUNCTION=";T0:PRINT
6060 IF ER=0 THEN 6570' OISPC
6070 GOTO 6200
6080 '
6100 'CONT2 - CHECK FOR CONSTANT
6110 X=ASC(LEFT$(T0$,$1)):IF X<40 OR X>57 THEN 6100
6120 T0=VAL(T0$)
6130 IF D1=0 THEN 6200
6140 PRINT"CONSTANT VAL=";T0:PRINT
6150 GOSUB 6570' OISPC
6160 GOTO 6200
6170 '
6180 GOSUB 6666' EVAL
6190 IF ER THEN RETURN
6200 VP=T0
6210 IF OP=0 THEN 6240
6220 PRINT"VPRS=";VP
6230 GOSUB 6500
6240 GOSUB 6410
6250 IF ER=2 THEN RETURN' COMMENT
6260 IF SP THEN 6290
6270 ER=0
6280 RETURN
6290 IF ER THEN 5000

```

★ FREE SHIPPING ★

WITHIN CONTINENTAL 48 STATES

**MICRO IMAGES
INDUSTRIES INC.**

TRY
US!

**MICRO IMAGES
INDUSTRIES INC.**

ARE YOU A DREAMER? IMAGINE THIS...

You place your order and it arrives when expected. "What do you know, they did ship that day!" You open your package and SURPRISE, it's what you ordered, not last year's version six times removed. "Wait a minute, I must have paid full retail to get this kind of service. H'mm, that's not it. These prices are among the lowest. What's the catch? I've got it! They charged me large shipping and handling charges No, not that either. It says here 'Free shipping within the Continental 48 States via UPS ground.' Only the differential is charged for UPS Blue or 1st Class. Now I've got it, it's only a dream!!!"

At Micro Images your dreams become reality! How do we do it? Simple, we tell the truth. If the item you order is not in stock — we tell you. If we can't ship that day — we tell you. Which version? We tell you. Why are we telling you this? The answer is easy. This is what we do best and what separates us from the competition, AND WE WANT YOU TO KNOW.

POSTMAN DELUXE

Deluxe Mass Mail - Mod I/III - \$119.95
Deluxe Var. w/Postwriter - \$144.95

MAXI MANAGER

Manager with Utility - \$119.95
Maxi Utility Only - \$44.95

SUPERUTILITY +

Mod I/III - Ver. 3.0 - \$59.95
SEE NEW BOOK BELOW

Data-Writer

New Version Mod I or III
\$124.95

MAXI CRAS

Mod I/III - \$84.95

LDOS 5.1

MDL I or III - \$109.95

GEAP - \$84.95

w/Dot Writer 1.5
Add'l Fonts - \$27.95 each

NEW SCRIPT - 7.0 - \$109.95

with Mailing Label Opt... \$119.95
Mailing Label Opt. Only... \$27.95

MAXI MAIL

Mod III Only
\$84.95

MAXI STAT

Model I/III
\$164.95

MULTIDOS - \$89.95

NEW VERSION 1.6
Specify Mod I or III Single or Dbl Density

DOSPLUS

Version 3.5S/3.5D/3.5III \$119.95
Version II For Model II \$199.95

MICROTERM - Mod I or III - \$69.95

MZAL - Ver. 2 Mod I or III \$119.95
TZAL - Mod III - Tape Only \$44.95
Basic Editor - Mod I/III Tape to Disk \$27.95

MICROSOFT - Model I Only

Fortran 80 or ALGOL \$89.95
Basic Compiler \$179.95
Editor/Assembler + Tape \$27.95 Disk \$45.95

PROSOFT UTILITIES

TRASHMAN - Mod I/III \$34.95
FASTER - Mod I/III \$26.95
RPM - Mod I/III \$21.95

TALLYMASTER Mod I or III - \$69.95

ELECTRIC WEBSTER w/Corr \$129.95
COPYART II \$129.95
ZORLOF \$64.95

BOOKS

How To Do It on the TRS 80 - WG \$27.95
Machine Lang. Disk I/O - WG \$27.95
TRS DOS 2.3 Decoded - WG \$27.95
Disk + Other Mysteries - WG \$20.95
Basic Decoded - WG \$27.95
Custom TRS-80 - WG \$27.95
Basic Faster & Better - WG \$27.95
Mod I/II Visicalc - W.C. Brown \$16.95
Mod I/II Visicalc - W.C. Brown \$16.95
Copyright Kit \$11.95
Inside Superutility Plus \$17.95

SPECIAL - \$1,795.00

LNW 80 - MODEL II

Includes Dosplus 3.4D, CPM 2.2 and LNW Hi-Res Basic

SYSTEM EXPANSION II - \$349.95

LNW-Doubler 5/8 \$199.95

Includes Dosplus 3.4D

★★ PRINTER STANDS ★★



SPACE AGE

MX80 No Frills Clear 13.50 Bronze 15.95
MX80 Space Age Clear 27.50 Bronze 29.95
Microline 82A Space Age wslot Clear 27.50 Bronze 29.95
Microline 83A Space Age wslot Clear 34.95 Bronze 39.95
NEC 8023A Space Age Clear 27.50 Bronze 29.95
MX100 Space Age Clear 34.95 Bronze 39.95

FLIP N FILE 5 1/4" \$26.95

MICRO SPOOLER

16 K... \$179.95 64K... \$269.95

LYNX Auto Dial/Answer Mod I/III - \$239.95

MICROBUFFER - Practical Peripherals

Parallel or Serial (Epson) \$149.95

GEMINI-10 \$349.00

100 CPS, BI-DIRECTIONAL, LOGIC SEEKING, HIGH RESOLUTION,
BIT IMAGE & BLOCK GRAPHICS, FRICITION AND TRACTOR FEED,
PLUS MUCH MORE!

RIBBONS

ZIP BOX RELOADS 1/2 Dz. Dz.

Epson MX 70/80-20 Yds.....	24.00	42.00
Epson MX 100-30 Yds.....	30.00	52.00
NEC/Prowriter-14 Yds.....	21.00	36.00

Centronics 730/737/739/779 or

LP-I/II/IV 16 Yds..... 18.00 32.00

All ZIP BOXES are individually sealed black nylon and require no rewinding. Epson Reloads also available in red, blue, brown, green & purple. Any mix allowed.

ZIP BOX RELOADS 1/2 Dz. Dz.

Epson MX 70/80/20 Yds..... 24.00 42.00

Epson MX 100-30 Yds..... 30.00 52.00

NEC/Prowriter-14 Yds..... 21.00 36.00

Centronics 730/737/739/779 or

LP-I/II/IV 16 Yds..... 18.00 32.00

All ZIP BOXES are individually sealed black nylon and require no rewinding. Epson Reloads also available in red, blue, brown, green & purple. Any mix allowed.

ZIP BOX RELOADS 1/2 Dz. Dz.

Epson MX 70/80 7.00 70.00

Epson MX100 12.00 125.00

Prowriter 8510 & NEC 8023A 7.50 80.00

RS LP I/IV 6.50 70.00

RS LP V/VII 6.50 65.00

RS DSY WH II or DWP 410 6.50 70.00

RS DSY WH II - Nylon 6.50 70.00

MICRLNE 80/82A/83A/92 N/A 30.00

MICRLNE 84 1/4x40 yds 5.50 60.00

Diablo Hytype II - Multi Strike 6.50 65.00

Qume Multi Strike 5.00 50.00

NEC Spin - Hy Yld - Multi Strike 7.00 70.00

Centronic 703/04/53 11.00 120.00

Minimum order 3 cartridges any mix. For smaller quantities add \$1.50 per order. All our reloads and cartridges are manufactured by one of the oldest and most reputable ribbon Mfg's in the country

***** QUALITY GUARANTEED *****

GAME SALE!

Game

Double Feature 31.95

Stratos or Rearguard 19.95 19.95

Cyborg or Jovian 17.95 21.95

Early Games 26.95 26.95

Zaxxon - Color 32k 33.95

Sea Dragon or Eliminator 17.95 19.95

Forbidden Planet or City 33.95

Outhouse or Fortress II 14.50 16.95

ORDERING INFORMATION

No credit cards at these low prices. Add \$2.00 on all COD orders. Certified C/MO/COD shipped immediately. Please allow 2 weeks for personal checks. For extra fast service phone in your COD order. Free shipping within Continental 48 states via UPS ground. For Canada, Hawaii, Alaska, applicable shipping and insurance charges apply. Prices subject to change without notice. New York State residents please add appropriate sales tax.

The items listed above are a cross-section of our product line. We carry the full line of most companies listed in this ad. plus much more. SEND FOR YOUR FREE CATALOG.

TO ORDER
CALL OR
WRITE TO:

**MICRO IMAGES
INDUSTRIES INC.**
146-03 25th Road
Flushing, N.Y. 11354
(212) 445-7124

• 157 CALL:
Mon-Thur.
10 AM-9 PM
Fri. & Sat.
10 AM-5 PM

157 CALL:
Mon-Thur.
10 AM-9 PM
Fri. & Sat.
10 AM-5 PM

```

6920 T0=VA(IN)
6930 IF D1=0 THEN 6970
6940 PRINT"STAT TOKEN =";SS(IN)
6950 PRINT"TOKEN VALUE =";T0
6960 GOSUB 6500: DISP
6970 RETURN
6980
6990   SUBROUTINE TO CALCULATE VARIABLES
7000
7010   CALC
7020   ER=0
7030   IF D1=0 THEN 7060
7040   PRINT"CALC SUB":PRINT
7050   PRINT"PREVIOUS OPERATOR =";PRS
7060   D0=0
7070   OP=D
7080   FOR X=1 TO 6
7090   IF PR$=MAS(X) THEN OP=X
7100   NEXTX
7110   IF OP>0 THEN 7170
7120   ER=1
7130   BEEP
7140   PRINT@096,"ILLEGAL OPERATOR (";T0$;") IN EQUATION ";A;
7150   RETURN
7160
7170   ON OP GOTO 7210,7250,7290,7330,7370,7410
7180
7190   EXPONENTIATION
7200
7210   AN=AN[VP
7220   RETURN
7230
7240   MULTIPLICATION
7250   AN=AN*VP
7260   RETURN
7270
7280   DIVISION
7290   AN=AN/VP
7300   RETURN
7310
7320   ADDITION
7330   AN=AN+VP
7340
7350   SUBTRACTION
7360   AN=AN-VP
7370   RETURN
7380
7390   EQUALS
7400
7410   D0=1
7420   IF ST=0 THEN RA(IN)=AN
7430   IF ST THEN VA(IN)=AN
7440   RETURN
7450
7460   SENSITIVITY ANALYSIS
7470
7480
7490
7500   PRINT@724,"SENSITIVITY ANALYSIS";
7510   FOR X=1 TO 100, SET DIST VAR TO NOMINAL
7520   RA(X)=QUT(X,1):NEXTX

```

Continued from p. 93

two variables, size of the resistor and size of the capacitor, assuming a constant battery voltage.

First consider the problem's components. The battery produces a constant voltage of 9.0 volts. The resistor is 10,000 ohms and has a manufacturing tolerance of plus or minus 10 percent. The capacitor is .22 microFarads, which you can express as .22 times 10 to the minus six (.22E-6) Farads and has a tolerance of +50 and -20 percent. The switch does not enter into the calculations.

In defining the variables, use the following set-up:

CONSTANTS: BATT,9 (Battery)
 DISTRIBUTED: RES, 10000, 10, (Resistor)
 10, 3
 CAP, .22E-6, 50, (Capacitor)
 20, 2

To find how long it takes the capacitor

to charge up to a specific voltage, use the following formula:

$$Tc = - \ln \left(1 - \frac{\text{Output V}}{\text{Applied V}} \right) \times R \times C$$

In this equation, the charge time (Tc) equals the negative of the natural log of the quantity in parentheses, times the resistor value (R) and times the capacitor value (C). Due to the program's limited mathematical evaluation power (it cannot use parentheses), you must break the equation above into several equations to input.

Call the output time (Tc) TIME and define it as a statistical variable, since it's the value with which you're ultimately concerned. The equation would appear as in Table 2.

The first equation evaluates the division within the parentheses. The second equation completes the rest of the calculation within the parentheses, and the

last equation finishes the remainder of the original equation.

Notice that you have to create two intermediate calculated variables to simplify the equation (Ratio and CVolt). You must define these in the variable section before using them in an equation.

Note also the way you create the negative of the log function by subtracting it from zero. The program would flag a negative sign by itself as an error.

Now enter into the computer all the variables and equations as previously defined. You have four constant/calculated variables, two distributed variables, one statistical variable, and three equations. Return to the main menu and enter the edit mode by pressing keys one through four.

To run the Monte Carlo analysis, press the enter key. The program asks for the number of trials; enter 50 to begin. As the program executes, the trial number and the equation the computer is currently calculating appear at the bottom of the screen.

When it completes the analysis, the program asks if you want a printout. If you have an attached printer, you can answer yes. Your printout will be similar to Fig. 16.

The first printout line is the title you

NO SPACE FOUND AFTER VARIABLE name IN EQUATION x
 name IS AN UNDEFINED SYMBOL IN EQUATION x
 ILLEGAL OPERATOR name IN EQUATION x

Table 1. Error messages in Monte Carlo analysis.

Volume 25 Number 1

NEW PRINTERS ADDED! FIND YOURS BELOW.
Good This Month

RIBBON SALE

Expect Replacements

Good This Month

RADIO SHACK - CENTRONICS - COMMODORE - EPSON - ANADEX - BASE 2 - IRIE - C. ITOH - IDS - DATA ROYAL - OTHERS

PRINTER MAKE, MODEL NUMBER (Contact us if your printer is not listed. We can probably RELOAD your old cartridges.)	RIBBON SIZE Inches by Yards	INSERTS EZ-LOAD™ DROP IN, NO WINDING! EXACT REPLACEMENTS made in our shop. Cartridges not included.		RELOADS PRI You SEND your used CARTRIDGES to us. We put OUR NEW INSERTS in them.		NEW CARTRIDGES (from the various manufacturers. Subject to availability.)		SILVER DOLLAR WIND TO LOAD WHY DO WE SELL THESE?
ANADEX 9000 Series	1/2 x 30	\$18/3	\$68/12	\$380/72	\$ 8/1	\$ 7 ea/J2 or more	*	*
BASE 2	1/2 x 20	\$15/3	\$54/12	\$288/72	\$ 7/1	\$ 6 ea/J2 or more	\$30/2	\$87/ 6
C. ITOH Prowriter 1550-8510	1/2 x 18	\$15/3	\$54/12	\$288/72	\$ 7/1	\$ 6 ea/J2 or more	\$16/2	\$48/ 6
NEC 8023	1/2 x 18	\$15/3	\$54/12	\$288/72	\$ 7/1	\$ 6 ea/J2 or more	\$16/2	\$48/ 6
RADIO SHACK DAISY WHEEL II	DWP 410						\$18/3	\$72/12
CARBON FILM (1419) RED GREEN COLORS BLUE BROWN LONG-LIFE FABRIC (1449)	1 x 145	\$24/6	\$42/12	\$234/72	\$ 5 ea. 3-11	\$ 4 ea. 12 or more	\$18/3	\$60/12
LP I-II-IV 700 Zip-Peck (1413) 730/737/739/779	1 x 130	\$30/6	\$52/12	\$268/72	\$ 6 ea. 3-11	\$ 5 ea. 12 or more	\$21/3	\$72/12
OMP-200, 120 (26-1483) OMP-500 (26-1482) OMP-2100 (28-1442)	1/4 x 25 Not Enclosed	\$21/3	\$78/12	\$510/72	\$ 8/1	\$ 7 ea/J2 or more	\$20/2	\$58/ 6
LP III-V (26-1414) LP VI-VIII OMP-400 (28-1418)	9/16 x 16	\$12/3	\$45/12	\$252/72				
LP VII DMP-100 (26-1424)	1/2 x 20	\$15/3	\$54/12	\$288/72	\$ 7/1	\$ 6 ea/J2 or more	\$27/2	\$81/ 6
EPSON MX 70-80 IBM MX 100	1/2 x 20	\$15/3	\$54/12	\$288/72	\$ 7/1	\$ 6 ea/J2 or more	\$24/2	\$72/ 6
CENTRONICS 352/352/6000 Series	5/16 x 14	\$15/3	\$54/12	\$288/72	\$ 8/1	\$ 7 ea/J2 or more	\$27/2	\$81/ 6
CDMMOCORE 8023P	Inker Loop						\$18/2	\$48/ 6
	1/2 x 20	\$15/3	\$54/12	\$288/72	\$ 7/1	\$ 6 ea/J2 or more	\$14/2	\$36/ 6
	1/2 x 30	\$18/3	\$68/12	\$360/72	\$ 8/1	\$ 7 ea/J2 or more	\$24/2	\$69/ 6
	1/2 x 70/85				\$14/1	\$13 ea/J2 or more		
	1/2 x 12	\$15/3	\$54/12	\$288/72	\$ 7/1	\$ 6 ea/J2 or more		
							SEND CHECK, MONEY ORDER, or COD TO:	
							B C C O M P C O	
							200 South 1st Street • 142	• 152

WORRIED ABOUT ORDERING BY MAIL? Relax. We've been in business for many years and can please the smallest and largest account. You receive some of the finest ribbons available made of our own exclusive IMAGE PLUS +™ fabric and carbon film. Our ribbons fit your printer exactly. COMPARE, but BEWARE! We order all our competitor's products and are amazed at what we get. Have you ever received a new fabric ribbon you had to unwind and dump out on the table before you could use it? We Have. Or, carbon film inserts that had no end-of-ribbon sensor? Or, cartridges with only HALF enough ribbon WITHOUT a Mobius Loop? (No bargain at ANY price!) We use the latest state-of-the-art production equipment and are blessed with a fine, dedicated staff. We guarantee everything we make, period. Our ribbons are made fresh daily and our goal is to ship your order within 24 hours. Write for our brochure, price list, and newsletter, INK SPOTSIM.

SEND CHECK, MONEY ORDER, or COD TO:
B C C O M P C O
800 South 17 Box 246
SUMMERSVILLE, MD 65571
CALL FOR LESS ON SATURDAY! 8:30 to 5:00 (C7)

COST PLUS 10%
SHACK COMPUTERS - SOFTWARE - SUPPLIES - ACCESSORIES
Call Casa or write for our **COST PLUS 10% FLYER !!!**

Lines continued

```

8050 IF PR=1 THEN LPRINT TAB(4); LPRINT SM(X,X1);
8060 PRINT USING UI$, RM; PRINT TAB(5.5);
8070 IF PR=1 THEN LPRINT TAB(5.6); RM;
8080 PRINT USING UI$, SM; IF PR=1 THEN LPRINT FNB(6.8); SM
8090 NEXT X1
8100 IF PR=8 THEN GOSUB 6580
8110 NEXT X
8120 ! WORST CASE ANALYSIS
8130 PRINT@960, CHR$30; "POSITIVE WORST CASE"
8140 FOR Y=1 TO 5
8150 FOR X=1 TO 5
8160 SP=(SP*(Y,X)-NO(Y))/NO(Y)*100
8170 SM=(SM*(Y,X)-NO(Y))/NO(Y)*100
8180 IF (SP>SM) THEN RA(X)=QU(X,1)*(1+QU(X,2)) ELSE RA(X)=QU(X,1)
* (1-QU(X,4))
8190 IF D3 THEN PRINT X; RA(X); !
8200 NEXT X; IF D3 THEN PRINT
8210 TR=Y; GOSUB 4130; IF ER THEN 850! CALC
8220 SP(X,0)=VA(Y); NEXT Y
8230 PRINT@960, CHR$30; "NEGATIVE WORST CASE"
8240 FOR Y=1 TO 5
8250 FOR X=1 TO 5
8260 SP=(SP*(Y,X)-NO(Y))/NO(Y)*100
8270 SM=(SM*(Y,X)-NO(Y))/NO(Y)*100
8280 IF (SP>SM) THEN RA(X)=QU(X,1)*(1-QU(X,4)) ELSE RA(X)=QU(X,1)
* (1+QU(X,2))
8290 IF D3 THEN PRINT X; RA(X); !
8300 NEXT X; IF D3 THEN PRINT
8310 TR=Y; GOSUB 4130; IF ER THEN 850! CALC
8320 SM(Y,0)=VA(Y); NEXT Y
8330 !
8340 PRINT; PRINT; PRINT TAB(16)"NOMINAL"TAB(34)"--" ! WOR
ST CASE -- --
8350 IF PR THEN LPRINT " "; LPRINT"STAT"TAB(16)"NOMINA
L"TAB(34)"--" WORST CASE -- --
8360 PRINT"VARIABLE"TAB(17)"VALUE"TAB(34)"POSITIVE"TAB(52)"NEGAT
IVE"!
8370 IF PR THEN LPRINT"VARIABLE"TAB(17)"VALUE"TAB(34)"POSITIVE"!
AB(52)"NEGATIVE"
8380 PRINT STRINGS(63,"-"); IF PR=1 THEN PRINT STRINGS(64,"-")
8390 FOR X=1 TO 5
8400 PRINT$$(X) TAB(16)!NO(X);TAB(33);SP(X,0);SM(X,0);TAB(51)
8410 IF PR THEN PRINT$$(X);TAB(16);NO(X);TAB(34);SP(X,0);TAB(52)
!SM(X,0)
8420 NEXT X
8430 IF PR=0 THEN GOSUB 6580;CLS' PAUSE
8440 IF PR=1 THEN LPRINT" "
8450 RETURN
8460 !
8470 ! SUBROUTINES
8480 !
8490 ! RANDOMIZE SUB
8500 ! IF DE THEN PRINT"RANDOM SUB"
8510 POR I=1 TO D
8520 D1=QU(I,3)
8530 GOSUB 8620; GET DIST
8540 IF R >=2 THEN SU=4 MINUS TOLERANCE
8550 IF R <3 THEN SU=2 PLUS TOLERANCE
8560 RA(I)=QU(1,)*(1-R*QU(I,SU))
8570 IF DE THEN PRINT I,"RAND VALUE =";RA(I)
8580 NEXT I

```

assign when the program asks for a comment line prior to the Monte Carlo analysis display. Next the program lists the initial values of the distributed variables. The plus and minus tolerances are in decimal form.

The next section shows the actual statistical analysis. The number of trials run appears, followed by a summary of each statistical variable. The mean is the arithmetic average of all the trials run.

The Std. Dev. is the standard deviation of the mean, the measure of how close each value is to the calculated mean. The smaller this number, the more closely the values group around the mean.

The high value and low value in the sample are records of the highest and

lowest values the program calculated for that variable over all the trials. This gives you an idea of the range of values. As the number of trials increases, these numbers approach the worst case values calculated in the sensitivity analysis.

The minimum is the lower limit you set when you enter the statistical variable. The percent under is the percent of values that fell below the limit during calculation of this variable. The maximum and percent over are the upper limits and percent over that limit respectively.

The sample printout also shows a graphical representation of the statistical section. The program automatically calculates the range using the minimum and maximum limits.

CONSTANT/CALCULATED:	BATT,9 VOLT, 3 RATIO, 0 CVOLT, 0	(Battery voltage) (Output voltage) (Intermediate) (Intermediate)
DISTRIBUTED:	RES, 10000, 10, 10, 3 CAP, .22E-6, 50, 20, 2	(Resistor) (Capacitor)
STATISTICAL:	TIME, .8E-3, 1E-3	
EQUATIONS:	VOLT / BATT = RATIO 1 - RATIO = CVOLT 0 - LOG CVOLT * RES * CAP = TIME	Output/Applied Parenthesis eval

Table 2. Equations for electronic circuit problem.

The number right of the range shows the number of values less than or equal to that range but greater than the previous range. When you total them, these numbers should equal the number of trials run.

Following the graphical sample is a list of equations used in the calculations. Last is a list of constant or calculated variables.

Note that the numbers after Ratio and CVolt are not the numbers you initially entered because they're calculated variables. They appear on the right side of an equation. The number you see is the one the program calculated for this variable on the last trial run. This number might change, depending on other variables in the equation.

This information indicates that you have a large distribution of values over the entire range in question. Five percent is under your minimum limit, and 15 percent is over the maximum.

The lowest value recorded was 7E-04 or .0007 and the highest number recorded was 1.3E-03 or .0013—not that far from the limits of .0003 to .0010. A small change in the tolerance of your parts should get you in range.

A sensitivity analysis would reveal which of the two components affects

```

8590 RETURN
8600 :
8610 :
8620 'GET DISTRIBUTION SUB
8630 SU=0
8640 IF DI=0 THEN R=1-2*RND(0):RETURN
8650 FOR T%=1 TO DI
8660 SU=SU+1-2*RND(0)
8670 NEXT%
8680 R=SU/DI
8690 RETURN
8700 :
8710 :
8720 STAT SUB
8730 FOR N=1 TO S
8740 IF VA(N)<ST(N,1) THEN ST(N,2)=ST(N,2)+1
8750 IF VA(N)>ST(N,3) THEN ST(N,3)=VA(N)
8760 IF VA(N)<ST(N,4) THEN ST(N,4)=VA(N).
8770 ST(N,5)=ST(N,5)+VA(N) * SUM
8780 ET(N,6)=ST(N,6)+VA(N) [2] * SUM OF SQUARES
8790 IF VA(N)>ST(N,7) THEN ST(N,8)=ST(N,8)+1
8800 FOR X=1 TO 13
8810 IF VA(N)<SM(N,X) AND VA(N)>SM(N,X-1) THEN SP(N,X)=SP(N,X)+1
1 SP(N,12)=SP(N,13)
8820 NEXTX :SP(N,12)=SP(N,13)
8830 NEXTN
8840 RETURN
8850 :
8860 ' CLEANUP SUB
8870 FOR X=1 TO S
8880 SI(X)=ABS(ST(X,6)/NU-ME(X)*100000/10000 ELSE SI(X)=INT(SQR(SI(X))
THEN SI(X)=INT(SQR(SI(X))*100000/10000 ELSE SI(X)=INT(ST(X,5)+1
*100)/100, STD DEV
8890 IF ST(X,5)/NU > -1 AND ST(X,5) < 1 THEN ME(X)=INT(ST(X,5)/N
U+100)/10000 ELSE ME(X)=INT(ST(X,5)/ND*100)/100, MEAN
8900 IF ST(X,3) > -1 AND ST(X,3) < 1 THEN ST(X,3)=INT(ST(X,3)*10
000/10000 ELSE ST(X,3)=INT(ST(X,3)*10000/1000
8910 IF ST(X,4) > -1 AND ST(X,4) < 1 THEN ST(X,4)=INT(ST(X,4)*10
000/10000 ELSE ST(X,4)=INT(ST(X,4)*1000)/1000
8920 NEXTX
8930 RETURN
8940 :
8950 INUM SUB
8960 A=0
8970 PRINT@960,CHR$(30); "INSERT LINE=Fraction - DELETE LINE=NULL
- ABORT EDIT=ENTER";
8980 PRINT@960,CHR$(30); :INPUT"Enter the number of the line to E
dit/Delete";A
8990 IF A>DV THEN 9960
9000 IF A>LI+1 THEN 9960
9010 IF A<LI THEN 9930
9020 A=LI+1;LI=A
9030 RETURN
9040 :
9050 'SUBROUTINE TO INPUT Y/N RESPONSE
9060 AS=INKEY$;IF AS==" " THEN 9060
9070 IF AS="Y" OR AS="Y" THEN AS="Y":GOTO9100
9080 IF AS="N" OR AS="n" THEN AS="N":GOTO9100
9090 GOTO 9060
9100 PRINT@896,CHR$(30); :RETURN
9110 :

```

Listing continued

**Computer
Case
Company**



RS204

One size does not fit all. Our cases are designed for specific hardware configurations. When you put your computer in our case, it fits hand-in-glove. Once your equipment is safely inside the attache-style carrying case, it never has to be taken out again. To operate, simply remove the lid and connect the power. To store your computer, disconnect the power, enclose your disks, working papers, and manuals in the compartments provided, and attach the lid. It's as easy as that.



WE MAKE A GREAT CASE FOR YOUR RADIO SHACK.

CALL TOLL FREE: (800) 848-7548

• AP106	Amdek Color I, II or III Monitor.....	119
• P401	Paper Tiger Printer (400/445/460).....	99
• P402	Centronics 730/737 & Radio Shack Printer.....	89
• P403	Epson MX70 or MX80, Microline 82A Printer or Color Computer.....	89
• P404	Epson MX100 Printer.....	99
• P405	IDS 560 or Prism 132 Printer.....	109
• P406	C. Itoh Starwriter/Printmaster F-10 Printer.....	119
• P407	Okidata Microline 83A or 84 Printer.....	99
• P408	C. Itoh Prowriter 2 Printer.....	99
• P409	C. Itoh Prowriter (Apple Dot Matrix) or NEC PC8023 Printer.....	89
• I8501	iBM Personal Computer with Keyboard.....	129
• I8502	iBM Monochrome Monitor.....	99
• CC50	Case Cart.....	79
• CC80	Matching Attache Case (5").....	85
• CC90	Matching Attache Case (3").....	75
• CC91	Matching Accessories Case (5 1/4" Diskettes, Paper, etc.).....	95
• CC92	5.25" Diskette Case (Holds 75 Diskettes).....	49

```

9120 PRINT#0960,"PRESS ANY KEY TO CONTINUE.";
9130 A$=INKEY$:IF A$="" THEN 9130 ELSE RETURN
9140
9150 'SUBROUTINE TO EDIT A STRING
9160 'RIGHT ARROW' MOVES CURSER RIGHT
9170 'LEFT ARROW' MOVES CURSER LEFT
9180 'UP ARROW' ENTERS/CANCELS INSERT MODE
9190 'DOWN ARROW' DELETES CHARACTER
9200 'CLEAR KEY' CLEARS LINE/STRING
9210 UP ARROW. QUIT W/NO CHANGE
9220 SHIFT UP ARROW. MOVES TO LINE END
9230 'SHIFT RIGHT ARROW' MOVES TO LINE END
9240
9250 PRINT#0932,CHR$(31);
9260 ES=LEFT$(ES,64);
9270 L=LEN(ES)
9280 FOR X=1 TO L
9290 ES$(X)=NIDS$(ES$,X,1)
9300 NEXTX
9310 PRINT#0996,ES; ' OUTPUT LINE
9320 Q=1:PRINT#0931+Q,CHR$(92);
9330 PRINT#095+Q,; SET CURSER AT LINE BEGINNING
9340 AS=INKEY$:IF AS="" THEN 9340: MAIN LOOP
9350 X=ASC(AS)
9360 IF X=-13 THEN 10100: DONE
9370 IF X=9 THEN 9550: RIGHT
9380 IF X=8 THEN 9630: LEFT
9390 IF X=10 OR X=26 THEN 9710: DELETE
9400 IF X=21 THEN 10170: CLEAR LINE
9410 IF X=27 THEN RETURN: QUIT
9420 IF X=24 THEN Q=1: GOTO 9510: HOME
9430 IF X=25 THEN Q=L:GOTO 9510: EOL
9440 IF X=91 THEN 9950: SWITCR INSERT FLAG
9450 IF IQ THEN 9050
9460
9470 ES(O)=AS: OVERTWRITE CHARACTER
9480 PRINT$AS; ' ECHO CHARACTER
9490 IF Q>L THEN L=Q: ADD TO LINE LEN
9500 Q=+1
9510 PRINT#0932,CHR$(30);:PRINT#0931+Q,CHR$(92);:PRINT#095+Q,;
9520 GOTO 9340
9530
9540 CURSER RIGHT
9550 GOSUB 10040: INSERT OFF
9560 IF Q>63 OR Q>L-1 THEN 9340: CANT GO RIGHT
9570 Q=+1
9580 PRINTCHR$(25);! PWARD SPACE
9590 PRINT#0932,CHR$(30);:PRINT#0931+Q,CHR$(92);:PRINT#095+Q,;
9600 GOTO 9340
9610
9620 CURSER LEFT
9630 GOSUB 10040: INSERT OFF
9640 IF Q<2 THEN 9340: CANT GO LEFT
9650 Q=0-1
9660 PRINTCHR$(24);! BACKSPACE
9670 PRINT#0932,CHR$(30);:PRINT#0931+Q,CHR$(92);:PRINT#095+Q,;
9680 GOTO 9340
9690
9700 ' DELETE
9710 GOSUB 10040
9720 IF L=0 THEN 9340

```

the answer more (is more sensitive). If possible, you should change that one.

Another Problem

Now, imagine a business decision problem in which you're trying to market a new product. You need to invest \$5,000 to bring this product to market. The three factors of uncertainty are selling price, variable cost, and annual sales volume. Each uniquely affects the profit from the product.

For the purposes of this example, assume the product has a one year life, and each of the factors is independent. You need two pieces of information from the analysis to make a more intelligent decision concerning this investment.

First, you need to know what kind of

average return on your investment you can expect from this product. You also need to know how much risk is involved based on the probabilities of achieving different profit levels.

Set the amount of the investment and the price as constant values. The variable cost and volume are unknown values, so they assume a probability distribution. Enter the variables of concern, the profit and return on investment, as statistical variables. The equations reflect the necessary calculations to obtain the profit and return on investment numbers (see Table 3).

After you enter this data, run a Monte Carlo analysis. Figure 17 is a sample printout of 10 trials; I used the same format as for the electronic circuit prob-

lem, but I'll briefly explain the data.

You see that a mean profit of about \$8,000 is what you expect. A mean return of about 60 percent is also within your limits. However, a 10 percent over limit figure appears on both values. The distribution is a little on the high side.

You'd be more competitive if you could cut your price but still maintain your minimum limits. Also, you should tighten your distribution on the profit, an indicator of the venture's riskiness. You can accomplish this by tightening the tolerances on your distributed variables.

Again, a sensitivity analysis would show the variables most sensitive to change and the absolute limits (worst case) of each variable. You should experiment with this problem to determine the optimum values for profit and return.

Remember that the benefit of Monte Carlo analysis over worst-case analysis is its ability to minimize risk through probability. It simulates the real world in a positive manner, instead of clouding your decision with unlikely pessimistic outcomes. ■

CONSTANT VARIABLES:

INVEST, 5000

DISTRIBUTED VARIABLES:

PRICE, 4.75

STATISTICAL VARIABLES:

VARCOST, 4, 1, 10, 5

VOLUME, 10000, 20, 20, 0

PROFIT, 10000, 5000

RETURN, 100, 25

$$\text{EQUATIONS: PRICE} - \text{VARCOST} * \text{VOLUME} = \text{PROFIT}$$

$$\text{INVEST} / \text{INVEST} - 1 * 100 = \text{RETURN}$$

Table 3. Set-up for Business decision problem.

Listing continued

```

9730 FOR X=Q TO L-1 : SHIFT CHARACTERS
9740 ES(X)=ES(X+1)
9750 NEXTX
9760 ES(X)="" :L=L-1:LAST CHAR
9770 PRINTCHR$(30); :CLEAR LINE
9780 FOR X=Q TO L: OUTPUT NEW LINE
9790 PRINTES(X);
9800 NEXTX
9810 PRINT@995+Q,: REPOSITION CURSER
9820 GOTO 9340
9830 :
9840 : INSERT
9850 IF L>63 THEN GOSUH 10040 :GOTO9340 : STRING TO LONG
9860 FOR X=L TO Q STEP-1: MAKE ROOM
9870 ES(X+1)=ES(X)
9880 NEXTX
9890 ES(Q)=AS(L-L+1) ADD CHARACTER
9900 PRINTAS:Q=0+1
9910 PRINT@B2,CCHR$(30); :PRINT@831+Q,CHR$(92); :PRINT@95+Q,:;
9920 GOTO 9710: OUTPUT LINE
9930 :
9940 : SWITCH INSERT
9950 IF IQ THEN GOSUH 10040 :GOTO9340
9960 IF IQ=0 THEN GOSUD 9900:GOTO9340
9970 :
9980 IQ=1: INSERT ON
9990 PRINT@960,"INSERT";
10000 PRINT@95+Q,:;
10010 RETDRN
10020 :
10030 : INSERT OFF
10040 PRINT@960,CHR$(30); :;
10050 PRINT@95+Q,:;
10060 IQ=0
10070 RETURN
10080 :
10090 'ON
10100 ES="" :GOSUH 10040
10110 FOR X=1TO L
10120 ES=ES$(X)
10130 NEXTX
10140 RETURN
10150 :
10160 : CLEAR
10170 FOR X=Q TO L
10180 ES(X)="" :NEXTX
10190 L=Q-1:GOTO9770
10200 :
10210 :
10220 :
10230 :FILE ERROR HANDLING
10240 ER=ERR/2+1
10250 IF ER>54 THEN PRINT@960,"FILE NOT FOUND - TRY AGAIN":;

ESTINE490
10260 PRINT@960,"***** ERROR (" ,ERR(ER),") - PRESS ANY KEY TO TRY
AGAIN";
10270 AS=INKEY$:IF AS=""THEN10270 ELSE PRINT@960,CHR$(30) ;
10280 RESUME NEXT
10290 :
10300 ENO

```

MODEL 4 \$1629⁰⁰

64K 2 Disk RS232

Model 4 Upgrade Kit. Converts TRS-80 Model III computers (except for cabinet and disk drives). Includes new keyboard, 64K RAM, sound, TRSDOS and Disk BASIC. #26-1123, \$699⁰⁰

DISK DRIVES

COLOR DRIVE 0	\$310.00
COLOR DRIVE 1	230.00
5 MEG HARD DISK	1725.00
12 MEG HARD DISK	2699.00

COMPUTERS

PC-2 POCKET	\$189.00
PC-3 POCKET	79.95
MODEL 100 8K	675.00
MODEL 100 24K	819.00
MODEL IV 18K	845.00
MODEL 16 128K 2D	4699.00

PRINTERS

OKIDATA 80	\$315.00	DMP-100	\$299.00
OKIDATA 82A	395.00	DMP-120	399.00
OKIDATA 83A	650.00	DMP-200	590.00
OKIDATA 84	990.00	DMP-400	999.00
OKIDATA 92	495.00	DMP-500	1499.00
OKIDATA 93	855.00	DMP-2100	1750.00
GEMINI 10X	330.00	CGP-115	199.00
GEMINI 15	475.00	P.C. PLOT	175.00
DAISY WHEEL II	\$1700.00		
DMP-410	1050.00		

MODEL 12

2 DISKS \$3250.00

ALL SOFTWARE 15% OFF

BODEX CORP.

224 East Main St. Marlboro Mass.

Phone 1 617 485 5115
or 481 1027

✓ 381

CASH PRICES

• TRS-80 is a trademark of Tandy Corporation.

Prices subject to change without notice.
Not responsible for typographic errors.

What's the DIF?

by David Haan

Format and print financial statements in one step with the DIF (data-interchange format) file while avoiding typographical errors.

I recently became the caretaker of my church's financial records. One of my duties is to provide monthly statements, in a simple form, for each church leader.

This statement includes a breakdown of the month's receipts, expenditures, and a balance forward (see Fig. 1). I also have to prepare a quarterly state-

ment summarizing the monthly totals for credit and debits to date.

Generating a quarterly report that could be distributed to the general membership sounded difficult. In the past, this report had been typewritten using the general ledger. This method was time-consuming and error-prone; errors made had to be corrected and the

report often had to be retyped.

VisiCalc, the package I chose to keep the church's records, contains an optional data-save format called DIF (data interchange format). A data file can be generated that is directly accessible from a Basic program of your own design. Using this technique, a report can be formatted and printed in one step, with no chance of typographical errors or an incorrectly read entry. See the sample quarterly statement in Fig. 2.

When you save a VisiCalc file using the DIF file option, a specific format is generated that can be accessed by many different languages, such as Pascal, Fortran, and Basic. This format standard, established by Software Arts Inc., is made up of header blocks that indicate the type of information that is to follow (see Fig. 3).

Header Items

Some of the seven different header items are the Table, Vectors, Tuples, and Data headers. When I saved the quarterly report of Fig. 2 as a DIF file, the first part of the file was organized in the format as shown in Fig. 4. In Fig. 4, the first header item is called Table. This header allows verification that the file is a data table. The two numbers following must be a zero and a one with a title string following. In this case, the title

ANYONE'S CHURCH, ANYWHERE, USA. SECOND QUARTER REPORT 1982

	DONATIONS	REQUIRED	OVER/SHRT	EXPENSES
THRU March 1982	11,242.99	—	10,313.55	=
April 1982	3,562.36	—	3,173.40	=
May 1982	4,258.42	—	3,966.75	=
June 1982	3,001.56	—	3,173.40	=
	22,065.33		20,627.10	
LESS: EXPENSES				
GENERAL FUND BALANCE				
CASH ON HAND				
July 1 1982				
	—	20,705.42		
		1,359.91		

GENERAL FUND REPORT

	BALANCE EXPENDED	REMAINING ON BUDGET
Minister Salary	11,100.00	11,100.00
Sunday School	362.87	287.13
Choir	150.00	50.00
General Supplies	1,375.16	774.84
Secretary	1,827.00	1,827.00
Utilities	3,823.56	2,576.44
Repair & Maintenance	2,066.83	3,933.17
	20,705.42	20,548.58

Figure 1. Monthly statement.

The Key Box

Model III
32K RAM
Disk Basic
VisiCalc
Printer

Since 1978

- REPUTATION BACKED BY YEARS OF EXPERIENCE.
- PIONEER IN DIRECT TO CONSUMER SALES OF MICRO COMPUTERS AND ELECTRONICS
- MILLIONS OF DOLLARS IN SALES OVER THE YEARS
- TENS OF THOUSANDS OF CUSTOMERS
- HONEST
- RELIABLE
- LARGE INVENTORY
- NAME BRAND PRODUCTS



MicroManagement Systems, Inc.

2803 Thomasville Road East
Cairo, Georgia 31728
(912) 377-7120

DISCOUNT PRICES



BUY DIRECT

**It's simple. . . .
CALL & SAVE MONEY**

"TELEMARKETING WORKS FOR YOU"

**1-800-841-0860
CONVENIENT ORDER ENTRY**

Ga & Infa 912-377-7120

COMPUTERS & EQUIPMENT

FRANKLIN
COMPUTER CORPORATION

ACE 1000 COMPUTER
ACE 1200 COMPUTER
FROM **\$CALL**

commodore
COMPUTERS

FROM **\$CALL**

Hayes®
MODEMS
\$239

MICRO MODEM I
SMART MODEM 300
SMART MODEM 1200

EPSON
PRINTERS
FROM **\$CALL**

FX-80.....SAVE
RX-80.....SAVE
MX-80.....SAVE
FX-100.....SAVE

DATA FLEX
APPLICATIONS
DATA BASE
BY DATA ACCESS
'CALL

COMREX
AMDEK
\$CALL

NOTICE

ALL PRODUCTS WE SELL ARE BRAND NEW AND COVERED BY THE MANUFACTURER'S SPECIFIC WARRANTIES. COPIES AVAILABLE UPON REQUEST.
WE DO NOT SELL ANY USED, RECONDITIONED, FOREIGN OR INFERIOR MODIFIED EQUIPMENT.
PRICES AND PRODUCTS SUBJECT TO CHANGE WITHOUT NOTICE.

TRS-80 COMPUTERS



PURE
RADIO SHACK
EQUIPMENT

DISCOUNT
PRICED
FROM

'818

'2639

'3998

'677

'99

COLOR COMPUTER....'CALL

WE SELL THE COMPLETE LINE
OF TRS-80 COMPUTERS
AND ACCESSORIES



**TRS-80
COMPUTERS**



MICRO COLOR
\$99

MODEL 100
\$677

EAGLE
COMPUTER
PC \$CALL

**WE SELL IBM PC
COMPATIBLES
CALL FOR
YOUR CHOICE**

Novation



**MODEMS
FROM '119**

- J-CAT
- D-CAT
- CAT
- AUTO CAT
- SMART CAT
- APPLE CAT

**TRS-80 PRINTERS
COMPLETE LINE FROM '199**

SMITH CORONA

**TP-I DAISY
WHEEL
PRINTER
FROM SCALL**

Stair

**PRINTERS
FROM '309
GEMINI
10X & 15**

C. Itoh

**PROWRITER
8510.....'397
NEW!
8600.....'CALL**

**OKIDATA
PRINTERS
FROM **\$CALL****

**MICROLINE SERIES
•80 •82A •83A
•84P •92P •93P
PACE MARK 2350P**

**PRINTER
CARDS
AND CABLES
GRAPPLER+**

**QUADRAM
CORPORATION**
•IBM BOARDS
•MICROFAZERS
•APPLE BOARDS
'CALL

FREE

UPON REQUEST

- DISCOUNT PRICE LIST & INFORMATION KIT
- WRITE TO:

MICRO MANAGEMENT SYSTEMS

TELEMARKET DEPT. #1
2803 THOMASVILLE RD. EAST
CAIRO, GEORGIA 31728

**NEW
PRODUCTS
'CALL**

**Verbatim
DATALIFE
DISKETTES
\$CALL**

Donations Needed/Wk 793.35	Budgeted In 1982 >	Min Sal 22200.00	Sun Sch 650.00	Choir 200.00	Gen Sup 2150.00	Secretary 3654.00	Utils 6400.00	Maint 6000.00	Mo Tots 41254.00	Needed 41254.00	Received	Ovr/Undr
January		1850.00	0.00	25.00	122.45	304.50	805.31	204.98	3312.24	3966.75	4471.02	504.27
February		1850.00	17.34	0.00	264.89	304.50	798.43	188.67	3423.83	3173.40	3646.25	472.85
March		1850.00	6.75	25.00	202.55	304.50	688.80	378.54	3456.14	3173.40	3125.72	-47.68
April		1850.00	0.00	0.00	404.30	304.50	589.56	256.09	3404.45	3173.40	3562.36	388.96
May		1850.00	128.46	0.00	266.08	304.50	522.45	597.05	3668.54	3966.75	4258.42	291.67
June		1850.00	210.32	100.00	114.89	304.50	419.01	441.50	3440.22	3173.40	3001.56	-171.84
July												
August												
September												
October												
November												
December												
TOTAL 1st Quarter		5550.00	24.09	50.00	589.89	913.50	2292.54	772.19	10192.21	10313.55	11242.99	929.44
TOTAL 2nd Quarter		11100.00	362.87	150.00	1375.16	1827.00	3823.56	2066.83	20705.42	20627.10	22065.33	1438.23
TOTAL 3rd Quarter												
TOTAL 4th Quarter												
BUDGET REMAINING	11100.00	287.13	50.00	774.84	1827.00	2576.44	3933.17	20548.58	20626.90			

Figure 2. Quarterly statement.

The data in the DIF file has the following format:

Type Indicator, Value

String

The type indicators and meanings are as follows:

Type Indicator	Meaning
-1	This type indicates that this is a special type of data. It is either a BOT (beginning of tuple) or an EOD (end of data). BOT or EOD will be in the string field and the value field will be 0.
0	This type indicates that this is numeric data and the data will appear in the value field. The data can be noninteger, signed, and have exponentiation. The string field will contain a V.
1	This type indicates that this is string data. The string data will appear in the string field, with a 0 in the value field.
2	This indicator is a special case and is used to pass special information between programs.

Figure 3. DIF file type indicators.

numeric or string data. You will notice that the first piece of information is a -1,0 followed by BOT. The field where the -1 is located is called the type indicator. Valid type indicators are -1, 0, 1, and 2. Figure 3 contains an explanation of what each type indicator means. As seen in Fig. 3, the -1,0 followed by BOT indicates that this is the beginning of a tuple. This will occur at the beginning of each tuple. The next item in Fig. 4 is a 1,0 followed by the word donations. If you refer back to Fig. 2, you will see that donations is the first piece of data located at the coordinates of the first vector and the first tuple. The type indicator 1 indicates that the data is string data, not numeric, and the number value field equals zero. The next data item of Fig. 4 is preceded by a 1,0, which is followed by Needed/Wk. In Fig. 2, Needed/Wk is at the coordinates of the first tuple and the second vector.

The third data item in Fig. 4 is a 0,793.35 followed by a V. The zero indicates that the data item is numeric and 793.35 is the value. The V following also indicates that the data is a numeric value.

If you continued printing the data beyond the end of Fig. 4, you would see that the data is saved one tuple at a time in the format of tuple 1, vector 1; tuple 1, vector 2; tuple 1, vector 3; and so on, until the entire tuple is saved. The next tuples are saved in the same manner until all of the tuples are saved. The final entry in the file after all the tuples are saved would be a -1,0 followed by EOD indicating the end of data.

This is a brief explanation of the DIF file format, and is only meant to give you the basics. For a complete explana-

is null and the Table header will not be used for anything in this demonstration.

The next header item, Vectors, indicates that the information following will give the number of vectors in the data file. A vector can be thought of as either a row across the page or as a column down the page. Its definition depends on whether the data file is saved in rows or in columns.

I used the vector in its default state, where a vector is defined as a row of information across the page. The number of vectors is indicated by the second

number following the word vectors. In Fig. 2, there are 22 vectors.

The third header item, Tuples, indicates that the information following will show the number of tuples in the data file. As with a vector, a tuple can be a row across the page or a column down the page. In the default condition, a tuple is a column of information. The number of tuples is indicated by the second number following the word tuples and in Fig. 2 it is 13.

The fourth header item, Data, indicates that the following data is either

WANTED

"Buyers" & We'll pay the shippin'

• CALL FREE (800) 654-4058•

"Call For Reduced Prices At Various Quantities"

Verbatim.

5 1/4" sin-side dbl-den.	2 45
5 1/4" dbl-side dbl-den.	3 50
5 1/4" sin-side quad	3 45
5 1/4" dbl-side quad	4 45
8" sin-side sin-den.	2 95
8" sin-side dbl-den.	3 40
8" dbl-side dbl-den.	3 95

Head Cleaning Kits.... 940
Refills. 1450

Prices per ea.
10 per box

Dysan.

5 1/4" sin-side dbl-den.	3 95
5 1/4" dbl-side dbl-den.	4 45
5 1/4" sin-side quad	4 45
5 1/4" dbl-side quad	4 95
8" sin-side sin-den.	3 45
8" sin-side dbl-den.	4 45
8" dbl-side dbl-den.	4 95

We Stock
"Bulk-Packed"
Diskettes

3M Scotch

5 1/4" sin-side dbl-den.	2 35
5 1/4" dbl-side dbl-den.	3 25
8" sin-side sin-den.	2 45
8" sin-side dbl-den.	3 00
8" dbl-side dbl-den.	3 95

Disk Minder
Smoked Plastic
Holds 75 Disks
17 95 ea.

Dealer Inquiries Welcomed

Diskette Connection™

✓441



P.O. Box 1674
Bethany, OK
73008

*(Continental U.S. only. Add 3¢ on orders under 40¢)

TRS-80™ OWNERS... Enter the World of POWERSOFT

Nationally Acclaimed Programs for the
TRS-80 Computers

Now from the authors of **SUPER UTILITY+** a complete line of software to increase the use and capabilities of your system.

While **SUPER UTILITY+** won recent honors as Utility Program of the year by the 200,000 readers of *80 Micro*, the quality and consistency carries through the complete Powersoft line.

Professionally written and completely documented, Powersoft programs are accepted as industry standards among TRS-80 enthusiasts.

SUPER UTILITY PLUS.....	74.95	PowerMAIL+.....	150.00
SCROLLOS.....	20.95	PowerGSM.....	89.95
TOOLBOX FOR LDOS.....	89.95	PowerBDY.....	49.95
MASTER MECHANIC SET FOR LDOS.....	39.95	PowerDRIVER.....	29.95
BASIC/E COMPILED SYSTEM.....	49.95	PowerTERM.....	29.95
MARE/80.....	49.95	INSIDE 80+.....	18.95
SUPERMOVE XFD SYSTEM.....	700.00	CR+ TECO MANUAL.....	14.95
OSPEUS II.....	250.00	SD+ SPECIAL EDITIONS.....	500.00

BOOT UP WITH POWERSOFT...

THE WORLD'S MOST POWERFUL SOFTWARE VENDOR!

WE SUPPORT LDOS! BUY ANY PRODUCT AND
GET LDOS FOR \$99!

SEND FOR OUR COMPLETE CATALOG TODAY!

DEALER INQUIRIES INVITED

AVAILABLE THROUGH SELECTED DEALERS EVERYWHERE

POWERSOFT

PRODUCTS FROM BREEZE/QSD INC

11500 Stemmons Fwy.
Suite 125
✓306 Dallas, Texas 75229
Info: (214) 484-2976
Orders Only 800-527-7432

COLOR COMPUTER SOFTWARE

COMPLETE YOUR WORD PROCESSOR

SPELL-RITE

THE Cassette Spelling Verifier

You've got the best word processor. Now complete your system with the best spelling verifier. Spell-Rite is a convenient, fast way to insure that all of your documents are letter perfect. Spell-Rite was designed specifically for cassette-based word processors. Like Yours!

Spell-Rite is easy to use, completely menu driven.

Spell-Rite is Fast! You can verify a 1000 word document in under 9 minutes - including cassette I/O.

Spell-Rite is complete. It comes with its own 10,000+ word dictionary which you can expand. Also included is a superb manual.

Spell-Rite works with any word processor that generates ASCII tape files, such as Color Scripsit. Super Color Writer and Telewriter 64. 32K of RAM and Extended Basic are required.

Cassettes and manual \$59.95

DISK BASIC AID

DISK BASIC
MADE BETTER

Your Color Disk Basic is one of the most powerful Basics on any computer. Add Disk Basic Aid and it also becomes one of the easiest to use! The Basic Aid package will make developing and entering Basic programs a snap. Here are just *SOME* of the great features Basic Aid contains.

- Full Screen Editing
- Automatic Line Numbering
- 2 Key entry of Basic keywords
- Cross Reference
- Automatic Key Repeat
- User definable keys

PLUS. Label support! This unique Basic Aid feature is a vast improvement in the Basic language. Label any line you want and use that label in all calls to that line. Forget about line numbers, just call routines by name like this

"ON A GOTD ENTERCHECKS, PAYABLES, EXIT"

A real time saver! And for transportability Basic Aid will convert all labels to line numbers.

These and other great features make Basic Aid a 'must' for anyone who writes or modifies Basic programs. Basic Aid runs on 32K or 64K Disk systems. It comes with complete documentation and our new heavy duty keyboard overlay.

Disk Basic Aid \$49.95

SPECTRUM — STICK

Put the joy back into color computing with the Spectrum Stick. This heavy duty joystick gives you a true feel of control. And it comes with an extra long cable and power on/off LED.

"...the feeling of this joystick is superb." March 1983, 80-Micro
TX: add sales tax \$39.95

Send check or money order for total purchase price, plus \$1.50 S & H. Charge cards: include all embossed information.

- Spell-Rite Disk Basic Aid
 Spectrum Stick Send Free Catalog

SEND TO

✓154

Eigen
Systems

P.O. Box 180006
Austin, Texas 78718
(512) 837-4665

Name _____

Address _____

80 _____

tion, you should obtain a supplemental information bulletin from Radio Shack entitled "Programmer's Guide to the Data Interchange Format."

The Listing

The Basic Program Listing accesses the data file, formats it, and prints it. Of particular note are lines 140-510. Lines 150-210 read the DIF file until the Vectors header type is found. (The Label header will be bypassed.) Once the Vectors header type is found (line 180), the number of vectors will be extracted, put in the variable NV and printed on the screen.

Next it searches for the tuples header type. Once it is found (line 190), the number of tuples will be extracted, put in the variable NT and printed on the CRT.

Finally, the Data header type is searched for and when found (line 200), control is passed to a routine that will read in the data (line 350). Here, two loops (one inside the other) are formed using the variables NT and NV to read all the data and place it into variables that will be used for printing the required report. Lines 360-390 look for the BOT while lines 400-450 pick up the actual data.

If at any time an error in the DIF file is detected, an appropriate message will be printed on the screen and execution of the program will be aborted.

You might have noticed that in assigning the data from the DIF file to variables, I did not test to see whether the type of data being accessed was a numeric or string value by checking the type indicator. This was because I knew the vector and tuple location of each string or numeric value by looking at the layout of Fig. 2, and knew that this layout was not expected to change in the foreseeable future. This allowed the code in the demonstration program to be simplified.

If the layout of the DIF file is unknown, or if it will change now and then, you will have to test the type indicator of each piece of data and assign the data to appropriate variables. The remaining portion of the program formats and prints the data. The resultant report printed from this sample DIF file is shown in Fig. 5. A neat and consistent format is printed without the need for typing or corrections. ■

David Haan lives at 4361 Estes St., Littleton, CO 80123.

A portion of the DIF file used in this example is listed below. A portion of the data is missing because it is repetitive and this figure is meant only to demonstrate the basic format of the DIF file.

TABLE	This header is bypassed by the program	
0,1		
VECTORS	0,22 The number of vectors in the file.	
TUPLES	0,13 The number of tuples in the file.	
DATA	0,0 Start of data block.	
-1,0	BOT Indicates beginning of tuple.	
1,0	DONATIONS First data item. Tuple 1 vector 1.	
1,0	NEEDED/WK Second data item. Tuple 1 vector 2.	
0,793,35	V First numeric item. Tuple 1 vector 3.	
V	<ul style="list-style-type: none"> * * * 	
1,0	TOTAL 3rd Data item. Tuple 1 vector 20.	
1,0	TOTAL 4th Data item. Tuple 1 vector 21.	
1,0	BUDGET Last data item. Tuple 1 vector 22.	
1,0	BOT Indicates beginning of next tuple.	
****The rest of the DIF file would follow here.....		

Figure 4. DIF file format.

1982	Donations	Cash	Cash	Minister	Sunday	General	Operating				
JUNE	Needed/Wk	Credits	Debits	Salary	School	Supplies	Utilities				
DEPOSITS	793.35	Bal. Frwd	1798.57		12950.00	497.45	150.00	889.73	2131.50	2995.45	4374.67

Date Descript. of Expense

June 6	General Fund	726.37
June 13	General Fund	844.21
June 20	General Fund	639.89
June 27	General Fund	791.09

Deposits	Subtotal	3001.56
----------	----------	---------

Date	Descript. of Expense	CK #							
June 2	Gas/Elec Company	3245	364.45						364.45
June 7	Church Choir	3246	100.00		100.00				
June 10	Williams Stationery	3247	74.89					74.89	
June 10	Citywide Rubbish	3248	22.50						22.50
June 15	Central Bell	3249	54.56						54.56
June 15	Southwest Rentals	3250	94.50						94.50
June 17	Bookstore	3251	210.32		210.32				
June 22	Phillip Thompson	3252	200.00						200.00
June 25	U.S. Postmaster	3253	40.00			40.00			
June 25	John R. Franklin	3254	304.50				304.50		
June 26	Capitol Electric	3255	124.50						124.50
June 30	Minister	3256	1850.00		1850.00				

Balance	Subtotals	4800.13	3440.22	1850.00	210.32	100.00	114.89	304.50	419.01	441.50
	Forward	1359.91		11100.00	287.13	50.00	774.84	1827.00	2576.44	3933.17

Figure 5. Quarterly report to be distributed.

Program Listing. Basic program to generate report for general distribution.

```
10 REM THIS PROGRAM WILL ACCESS A DIF FILE GENERATED BY VISICALC A
ND
20 REM PROCESS THE DATA SO THAT A QUARTERLY REPORT CAN BE GENERAT
ED.
30 CLEAR 2000:DEFDBL D,E,O,R,S,T,V
40 BS="#$,###.##"
50 DIM T(50),SU(50),FS$(50),V(50),VS(50),RE(50):REM ALLOWS 50 VECT
ORS & TUPLES.
60 DIM M$(15),OS(50),RQ(50),DO(50),ET(50)
70 CLS:PRINT"THIS ROUTINE WILL GENERATE A QUARTERLY REPORT OF YOUR
CHOICE."
80 PRINT:INPUT"ENTER YEAR";YR
90 PRINT:INPUT"ENTER THE QUARTERLY REPORT REQUIRED (1, 2, 3, 4).";Q
Q:IF Q<1 OR Q>4 GOTO 90
100 REM *****
110 REM THE DIF FILE IS OPENED AND THE NECESSARY HEADER ITEMS SEAR
CHED FOR.
120 REM *****
130 PRINT:INPUT"ENTER THE DIF FILENAME THE REPORT IS TO USE.";FS
140 OPEN "I",1,FS
150 INPUT #1,T$
160 INPUT #1,N
170 INPUT #1,S$
180 IF T$="VECTORS" THEN 220
190 IF T$="TUPLES" THEN 270
200 IF T$="DATA" THEN 350
210 GOTO 150
220 NV=N
230 PRINT"THE FILE HAS ";NV;"VECTORS"
240 IF NV<51 THEN 150:REM MAKES SURE FILE NOT TOO BIG.
250 PRINT"TOO MANY VECTORS TO HANDLE."
260 CLOSE 1:STOP
270 NT=N
280 PRINT"THE FILE HAS ";NT;"TUPLES."
290 IF NT<51 THEN 150:REM MAKES SURE FILE NOT TOO BIG.
300 PRINT"TOO MANY TUPLES TO HANDLE."
310 CLOSE 1:STOP
320 REM *****
330 REM GET DATA FROM DISK STARTING WITH FIRST TUPLE.
340 REM *****
350 FOR I=1 TO NT
360 INPUT #1,T1,V1
370 INPUT #1,S$
380 IF T1<>-1 GOTO 1050
390 IF S$<>"BOT" GOTO 1070
400 FOR K=1 TO NV:REM GET ALL VECTORS IN TUPLE.
410 INPUT #1,T1,V1
420 INPUT #1,S$
430 IF T1=-1 GOTO 1090:REM MAKE SURE IT'S NOT BOT OR EOD.
440 V(K)=V1:VS(K)=S:T(K)=T1
450 NEXT K
460 IF I=1 GOSUB 1110:REM GET MONTHS OF YEAR FROM FIRST TUPLE.
470 IF I>2 GOSUB 1150:REM GET NUMERIC DATA.
480 IF I<(NT-3)GOTO 500
490 ON (NT-I+1) GOSUB 1170,1210,1250,1290
500 NEXT I
510 CLOSE 1
520 REM *****
530 REM THIS SECTION FORMATS THE DATA AND PRINTS THE REPORT
540 REM *****
550 IF Q=1 THEN OS="FIRST"
560 IF Q=2 THEN OS="SECOND"
570 IF Q=3 THEN OS="THIRD"
580 IF Q=4 THEN OS="FOURTH"
590 LPRINT TAB(23)"ANYONE'S CHURCH, ANYWHERE, USA."
600 LPRINT TAB(25)Q$;" QUARTER REPORT";YR
610 LPRINT:LPRINT TAB(29)"DONATIONS";TAB(45)"REQUIRED";TAB(59)"OVE
R/SERT";TAB(72)"EXPENSES"
620 LPRINT TAB(29)"-----";TAB(44)"-----";TAB(59)"-----";
630 IF Q=1 GOTO 600
640 LPRINT"THRU ";MS(Q*3-3);YR;TAB(20)USING BS;DO(12+Q);
650 LPRINT TAB(41)"-";TAB(43)USING BS;RQ(12+Q);
660 LPRINT TAB(55)"=";TAB(50)USING BS;OS(12+Q);
670 LPRINT TAB(70)USING BS;ET(12+Q)
680 LPRINT MS(Q*3-2);TAB(10)YR;TAB(20)USING BS;DO(Q*3-2);
690 LPRINT TAB(41)"-";TAB(43)USING BS;RQ(Q*3-2);
700 LPRINT TAB(55)"=";TAB(50)USING BS;OS(Q*3-2);
710 LPRINT TAB(70)USING BS;ET(Q*3-2)
720 LPRINT MS(Q*3-1);TAB(10)YR;TAB(20)USING BS;DO(Q*3-1);
730 LPRINT TAB(41)"-";TAB(43)USING BS;RQ(Q*3-1);
740 LPRINT TAB(55)"=";TAB(50)USING BS;OS(Q*3-1);
750 LPRINT TAB(70)USING BS;ET(Q*3-1)
760 LPRINT MS(Q*3);TAB(10)YR;TAB(20)USING BS;DO(Q*3);
770 LPRINT TAB(41)"-";TAB(43)USING BS;RQ(Q*3);
780 LPRINT TAB(55)"=";TAB(50)USING BS;OS(Q*3);
```

Listing continued



\$22.50
(PER BOX OF 5 1/4")

**Scotch
DISKETTES**
1 side/D Density
(744D-O) diskettes
compatible with
Verbatim (MD525-01)

**\$19.95 Scotch
Head Cleaning
Kits** 5 1/4" and 8" Kits —

DISKETTE-JUNCTION
stocks a complete
line of **3M** magnetic media
including **96TPI Quad Density**.
Call now to order the Scotch
diskette for your equipment.

TOLL FREE
800-321-5134
Ohio Residents Call
216-676-5640
DISKETTE JUNCTION
5916 Smith Rd.
Cleveland, Ohio 44142

WE ACCEPT
VISA • MASTER CARD
CHECKS • MONEY ORDERS • C.O.D.
• Add \$3.00 for shipping & handling.
• \$2.00 EXTRA for U.S. Mail delivery.
• \$3.00 EXTRA for C.O.D.
• Ohio residents add 8.5% sales tax.

Authorized Distributor
Information Processing Products



```

790 LPRINT TAB(70)USING B$;ET(Q*3)
000 LPRINTTAB(29)-----;TAB(44)-----;TAB(59)-----
;TAB(71)-----
010 LPRINT TAB(28)USING B$;DO(13+Q);
020 LPRINT TAB(43)USING B$;RQ(13+Q);
030 LPRINT TAB(58)USING B$;OS(13+Q);
040 LPRINT TAB(70)USING B$;ET(13+Q)
050 TE=ET(13+Q):LPRINT"LESS: EXPENSES";TAB(20)USING B$;-TE
060 LPRINT TAB(29)-----
070 LPRINT"GENERAL FUND BALANCE";TAB(28)USING B$;DO(13+Q)-TE
080 LPRINT"CASH ON HANO"
090 IF Q=4 THEN Q=0: YR=YR+1
090 LPRINT MS(Q*3+1); " 1";YR; TAB(20)USING B$;DO(13+Q)-TE
010 LPRINT:LPRINT:LPRINT
020 LPRINT TAB(30)"GENERAL FUND REPORT"
030 LPRINT TAB(30)-----
040 LPRINT TAB(51)"BALANCE REMAINING"
050 LPRINT TAB(31)"EXPENDED";TAB(55)"ON BUDGET"
060 LPRINT TAB(31)-----;TAB(55)-----
070 LPRINT:FOR I=1 TO NT-6
080 LPRINT FSS(I),TAB(29)USING B$;SU(I);
090 LPRINT TAB(54)USING B$;RE(I)
1000 NEXT I
1010 LPRINT TAB(30)-----;TAB(55)-----
1020 LPRINT TAB(29)USING B$;ET(Q+13);
1030 LPRINT TAB(54)USING B$;RE(NT-5)
1040 CLS:PRINT#440,"QUARTERLY REPORT COMPLETEO":END
1050 PRINT"NOT BEGINNING OF TUPLE INDICATOR"
1060 STOP
1070 PRINT"NO 'BOT' "
1080 STOP
1090 PRINT"END OF DATA INDICATOR"
1100 STOP
1110 FOR C=1 TO 12
1120 MS(C)=VS(C+4)
1130 NEXT C
1140 RETURN
1150 SU(I-2)=V(NV-5+Q):RE(I-2)=V(NV):FSS(I-2)=VS(1)
1160 RETURN
1170 FOR C=1 TO 17
1180 OS(C)=V(C+4)
1190 NEXT C
1200 RETURN
1210 FOR C=1 TO 17
1220 DO(C)=V(C+4)
1230 NEXT C
1240 RETURN
1250 FOR C=1 TO 17
1260 RQ(C)=V(C+4)
1270 NEXT C
1280 RETURN
1290 FOR C=1 TO 17
1300 ET(C)=V(C+4)
1310 NEXT C
1320 RETURN

```

ARE YOU FLEX-ABLE?

SPECTRAL ASSOCIATES FLEX - PLUS DOS

BETTER BECAUSE IT COSTS LESS! BETTER BECAUSE YOU GET MORE!!

FLEX + DOES NOT 'STEAL' USER RAM FOR SCREEN DRIVERS	FLEX + HAS A FASTER 51x24 COLUMN SCREEN DRIVER
FLEX + IS THE CLOSEST IMPLEMENTATION AVAILABLE	FLEX + IS 3 TIMES FASTER—LOADS IN SEVEN SECONDS
FLEX + HAS FASTER DISK RESPONSE TIMES	FLEX + HAS BEEN PROVEN TO BE MORE RELIABLE
BUY FLEX PLUS NOW AND SAVE UP TO \$20.00 OVER AN ALREADY LOW PRICE!!	
FLEX + DOS.....	WAS \$69.95 NOW \$59.95
TSC EDITOR.....	WAS \$25.00 NOW \$22.50
TSC ASSEMBLER.....	WAS \$25.00 NOW \$22.50
BOTH EDITOR AND ASSEMBLER.....	WAS \$50.00 NOW \$40.00
BOTH WITH FLEX + DOS.....	WAS \$119.00 NOW \$100.00

NEW RELEASE—WITH SOURCE CODE	NEW RELEASE—WITH SOURCE CODE
UTILITY PAC #1 \$24.95	UTILITY PAC #2 \$24.95
—AN EXCELLENT GENERAL PACKAGE—	—MAKE RAM SIMULATE AN EXTRA DRIVE—

ACAT	LOADTXT	RAMCMD—MAKES ANY DISK COMMAND MEMORY RESIDENT
ADEL	SAVETXT	RAMCAT—CATALOGS MEMORY RESIDENT
AGET	OFFLOAD	COMMANDS
UNDEL	GETCHAIN	RAMKILL—DELETES THE MEMORY RESIDENT COMMANDS

***AVAILABLE SOON: COPY TRSDOS TO FLEX—TEXT AND BINARY

SPECTRAL ASSOCIATES, 3420 SOUTH 90TH STREET, TACOMA, WASHINGTON 98409
QUESTION AND ANSWER ORDER LINE (206) 581-6938 *TOLL FREE ORDER ONLY (800) 426-1830

RUN BASIC PROGRAMS AT SUPER SPEED WITH ZBASIC 2.2.

THE WORLDS FASTEST TRS-80 BASIC COMPILER from SIMUTEK

BELIEVE IT OR NOT WE'VE ADDED MORE NEW FEATURES to the ONLY INTERACTIVE BASIC COMPILER for the TRS-80!

1. Speed increases of 10-100 times are typical after compilation.
2. Compiled code can be RELOCATED to run anywhere in memory. Code is even ROMable!
3. ZBASIC 2.2 NOW SUPPORTS BOTH RANDOM and SEQUENTIAL DISK I/O.
4. ZBASIC 2.2 is now a super tool for business programmers: RANDOM ACCESS FILES, and PRINT USING statements are supported as well as a HIGH PRECISION MATH package (with no rounding problems).
5. Special BUILT-IN MACHINE LANGUAGE COMMANDS to increase program operation by as much as 1000 times! Special commands are implemented for fast memory searching (CPDR, CPIR), block memory moves (LDIR, LDDR), inputting and printing HEX numbers, inserting MACHINE LANGUAGE into COMPILED CODE, disabling and enabling interrupts, inverting memory, 16 bit PEEKs and POKEs, and stack control, debug and much more.
6. ZBASIC 2.2 compiles the ENTIRE PROGRAM into Z-80 machine language. (Not 8080 code or a combination of BASIC and machine language like some other compilers.) Clumsy LINKING LOADERS, and RUNTIME MODULES are not needed; ZBASIC 2.2 creates a ready to run MACHINE LANGUAGE program.
7. NO ROYALTIES imposed on registered ZBASIC owners.
8. Typical COMPILE TIME is TWO SECONDS for a 4K program.
9. Use TRS-80 Basic to write ZBASIC programs!
10. Compile some existing programs with only minor changes. (BASIC programming experience is required.)
11. Fully compatible with both the Model I and the Model III. Mod I compiled programs work on a MODEL III, and vice-versa. ZBASIC works with NEWDOS-80, NEWDOS+, DOSPLUS, LDOS, MULTIDOS, ULTRADOS, TRSDOS etc. (Not TRSDOS Mod I double density)
12. BUILT-IN and much improved MUSIC and SOUND EFFECTS commands.
13. Improved CHAINING for disk users.
14. TIME\$ now available on DISK version. (Mod I only)
15. ZBASIC 2.2 now has an INPUT @ command (similar to PRINT @).
16. The TAB function will now tab 255 columns on a printer. (BASIC cannot tab past column 64.)
17. NEWDOS 80.20 USERS can use the CMD "dos command" function! (DOSPLUS may use name "dos command")
18. NEW and EASIER to use USR COMMANDS.
19. New math functions to calculate XOR and INTEGER REMAINDERS of a DIVISION
20. Logical STRING COMPARISONS are now supported.
21. The disk commands INSTR, MID\$ ASSIGNMENT are now supported on both DISK AND TAPE ZBASIC.
22. DEFSTR is now supported.
23. Eight disk files may be opened simultaneously; random, sequential or mixed.
24. LINE INPUT#, is now supported.
25. Invoke the compiler by simply hitting these two keys: ":" - "
26. NEW 60+ PAGE MANUAL WITH DESCRIPTIONS AND EXAMPLE.
27. ZBASIC 2.2 Comes with CMDFILE/CMD program from MISOSYS, to allow appending or merging compiled programs and machine language programs from tape or disk.

ZBASIC 2.2 DOES NOT SUPPORT THESE BASIC COMMANDS:

1. ATN, EXP, COS, SIN, LOG, TAN, and exponentiation. (However, subroutines are included in the manual for these functions.)
2. ERROR, ON ERROR GOTO, ERL, ERR RESUME.
3. No direct commands like AUTO, EDIT, LIST, LLIST ETC, although these commands may be used when writing programs.
4. Others NOT supported: COBL, CINT, CSNG, DEFFN, FIX, FRE.
5. Normal CASSETTE I/O. (ZBASIC supports its own SPECIAL CASSETTE I/O statements.)
6. SOME BASIC COMMANDS MAY DIFFER IN ZBASIC. For instance, END jumps to DOS READY, STOP jumps to BASIC READY etc.
7. MEMORY REQUIREMENTS: to approximate the largest BASIC program that can be compiled in your machine (at one time), enter BASIC and type: PRINT [MEM-6500]/2. Remember, you can merge compiled programs together to fill memory.

ZBASIC 2.2 SPEED COMPARISON DEMO

To help give you an idea how fast compiled programs are, we have included this demo program:

ZBASIC 2.2 DEMO PROGRAM

Time to compile and run complete program	: 0 MIN. 2 SEC.
BASIC Execution speed MOD 1, LEVEL II	: 7 MIN. 34 SEC.
ZBASIC Execution speed MOD 1, LEVEL II	: 10 MIN. 18 SEC.
BASIC Program size (WITHOUT VARIABLES)	: 895 BYTES
ZBASIC Program size (WITHOUT VARIABLES)	: 2733 BYTES

(Remember that the ZBASIC program includes an 1879 byte subroutine package.) Program shown exactly as compiled and run in BASIC and ZBASIC.

```

10 ====== ZBASIC 2.2 EXAMPLE PROGRAM AND TIME TEST ======
20 CLS:CLEAR100:DEFINT A-X:DEFSTR Z:DIM AA(64,24),Z(50):RANDOM
30 AA=100:BB=-9999:CC=3:DD=-3:EE=-9999:ST="START TIME "+TIME$
40 FOR I=1 TO 127 STEP 2:FOR J=47 TO 101 STEP -3:XX=POINT(I,J):SET(I,J)
50 XX=I+J\CC*(7-I+J):XX=ABS(INT(RND(I+J)-AA)+7):OUT255,J AND (3+J):XX=INP(I)
60 XX=PEEK(I+J):POKE15360+I+J,XX:OUT255,J AND (3+J):XX=INP(I)
70 BB=STR$(I+J):BA$=LEFT$(BB,2):AA(I/2,J/2)=VAL(BA$)+AA*3
80 BA$=BA$+RIGHT$(BA$,RND(3)):XX=INSTR(1,BA$,"$"):XX=SBR(I+J)
90 BA$=MID$(BA$,2,2):(MID$(BA$,1,1)=Z :IF XX THEN 100 ELSE CLS
100 IF LEN(BA$)<3 OR SGN(XX)=1 AND ASC(BA$)=32 THEN PRINT "+";;
110 IF POS(0,BA$) >= 2 THEN TRON(TROFF):PRINT ELSE XX=NOT(RND(99))+100
120 A$=INKEY$:IF A$=="Y" OR A$==" " AND I<120 THEN PRINT "TRUE.."
130 RESTORE :READA,C,Z(J),D:gosub170:gosub170:gosub170:goto210
140 NEXT :PRINT "+":NEXT:I:CLS:PRINT#512,ST,"STOP TIME "+TIME$
150 STOP ====== END OF MAIN TEST LOOP ======
160 DATA 12345,-1,"TEST",-9999
170 ON RND(6) GOTO 180,190,200,180,190,200
180 RETURN
190 RETURN
200 RETURN
210 ON RND(3) GOSUB 180,190,200,180,190,200,180,190,200
220 GOTO140

```

NOTICE ZBASIC 2.0 OWNERS you can upgrade your ZBASIC 2.0 for no charge. Just send us your original diskette/cassette and \$15.00 with your registered serial number and copy of your invoice. We will send your ZBASIC 2.2 and updates to your manual.

VISA, MASTERCARD, AMERICAN EXPRESS, C.O.D. ORDERS CALL

800 528-1149 order line

ZBASIC 2.2 DISK VERSION AND MANUAL	89.95
ZBASIC 2.2 TAPE VERSION AND MANUAL	79.95
ZBASIC 2.2 DISK & TAPE VERSION AND MANUAL	99.99
MANUAL ONLY...[APPLIES TO PURCHASE]	25.00

SIMUTEK COMPUTER PRODUCTS INC.

TECHNICAL QUESTIONS PLEASE CALL (602) 323-9391
4897 E. SPEEDWAY, TUCSON, ARIZONA 85712

✓ 12

TRS-80 is tm of Radio Shack, a Tandy Corp.

Saving Strings

by David M. Keil

If you type faster than INKEY\$ routines accept data, this program is for you. It keeps pace with even the fastest typists.

When you answer INKEY\$ routine prompts, characters typed in too fast aren't recorded. No matter how tight you make the routine, it never seems to keep up with the average typist. This is because the Model 1/III takes time to verify each character, display it, and then add it to the input string. While the computer goes through this process, you might type in another character, which the computer doesn't register. That's the problem; here's the solution.

How It Works

The computer keeps track of the cursor's location and line 110 PEEKs it out of memory and puts it into Z1. Then it puts a block cursor at the present cursor position.

Lines 120 and 130 check whether a character has been input. The charac-

ter is then converted to its ASCII value and stored in A. Numeric variables are faster to work with than strings.

The program then determines if you've pressed enter. If not, it checks for a valid character. If you've input no character or an invalid one, the program returns control to line 120. If the character is valid, the program POKEs a space into the current cursor position and continues to line 140.

Line 140 subtracts 15360 from Z1 to make it a Print @ location and compares it to LC. LC is the starting position of the input. If LC and Z1 are equal, the back arrow is an invalid input.

Then Z1 is compared to LC + IP. IP is the maximum number of characters allowed. If LC + IP and Z1 are equal, all characters except the back arrow are invalid.

If either condition is met, the character is not printed and control returns to line 110. Otherwise, the character prints and control returns to line 110.

Values are stored only on the screen. To put a character into memory, you just move the value from the screen into a string. You could PEEK the value from the screen one character at a time but a long string (20 characters or more) takes a while.

Line 150 is the line that makes this routine different. POKE a space into the current cursor position and add 15360 to LC to make it a memory address so you can compare it to Z1 (the cursor's memory address). Next, use a little-known instruction called VARPTR, which loads the memory address of where A\$'s address is

The Key Box

**Model 1 and III
4K RAM
Cassette Basic**

```

5 CLS
10 LC=512 : IP=16 : PRINT GLC,; : GOSUB 180
20 END
180 REM INKEY INPUT ROUTINE
110 Z1=PEEK(16417)*256+PEEK(16416) : POKE Z1,143
120 A$=INKEY$ : IP A$="" THEN 120 ELSE A$=ASC(A$) : IF A=13 THEN
150
130 IF A<>8 AND A<32 OR A>96 THEN 120 ELSE POKE Z1,32
140 Z1=Z1-15360 : IF Z1=LC AND A=8 THEN 118 ELSE IF Z1=LC+IP AND
A<>8 THEN 119 ELSE PRINT A$; : GOTO 119
150 POKE Z1,32 : LC=LC+15360 : A=VARPTR(A$) : POKE A,Z1-LC : POK
E A+1,LC-INT(LC/256)*256 : POKE A+2,INT(LC/256) : IP$=A$
160 RETURN

```

Program Listing

stored into A\$.

Now for the fun. You are going to POKE new values into A\$'s memory addresses to move the contents of video memory into A\$. First you POKE the difference between Z1 and LC into memory addressed by A. This holds the length of A\$, which is 0-255. Next, A+1 and A+2 hold the least-significant byte and the most-significant byte of where A\$ is stored in memory. You now POKE the address where the string is stored in video memory into A\$'s memory addresses.

That's it. Now A\$ contains the values in video memory. In fact, A\$ is actually stored in video memory. All you have to do is assign A\$ to some other variable (in my program, IP\$) and return.

All this seems to be a long process but to the computer it is fast and easy. You have eliminated string addition and subtraction and given your input routine a block cursor. All this makes for a very fast and powerful INKEY\$ routine.

How to Use It

Using this program is easier than knowing how it works. Load LC

where you wish your input to be. Then load IP with the maximum number of characters to be input. Now move the cursor to the correct location on the screen by printing at LC.

The program listed clears the screen and allows input at screen position 512.

"This program will work with any INKEY\$ routine and eliminate those lost characters."

When you press the enter key the program ends. When it ends, type the following:

PRINT AS,IP\$

and press the enter key. Whatever you typed should print twice. To find out if A\$ is stored in video memory, list the program and print A\$ again. A\$ contains whatever is on the screen at posi-

tion 512. Now you see why you have to assign A\$ to another variable before returning.

Here are a few more things you need to know before you use this program. Once A\$ is reassigned it will be stored in high memory. So don't worry about using A\$ anywhere else in your program. You can locate lines 110-160 anywhere in your program.

Don't be afraid to modify this program. Only the way of moving the input from the screen is new, so experiment. With a few changes this program allows you to use the shift right and left arrows to let the cursor move over characters without erasing them.

If you want to stop character loss in programs containing other INKEY\$ routines I have another solution. A machine-language buffer utility will allow you to key ahead of your program. This program will work with any INKEY\$ routine and eliminate those lost characters. ■

David Keil (10 W. Wilburn Ave., Greenville, SC 29611) is employed by the Better Software Assoc., where he is vice president in charge of software development.

DIABLO DAISY WHEEL PRINTER

\$795

- Standard Centronics Parallel or Serial RS232
- Compatible with most computers — Ask About Yours!
- High Speed Heavy Duty, Commercial Grade
- Full 132 Column Printout Capacity
- 2,000 Character Print Buffer — No waiting on Printer
- Tested and reconditioned by Johnson & Johnson
- Full parts and labor WARRANTY
- 375,000 Character Ribbon Included FREE!
- Uses Metal Printwheel Included FREE!
- Friction Feed Standard
- Serial Baud Rates up to 19,200

USE ALL THESE FEATURES AND MORE!

- 10-12 Pitch and True Proportional Spacing
- Bi-Directional Printing
- Bold Printing
- Underline Words or Sentences
- Subscripts and Superscripts
- Multiple Tabs
- Graphics up to 120 inch
- Communications commands with serial
- Built-in self tests and Diagnostics
- Strike-through Printing

PRINTS AVERAGE LETTER FASTER THAN 80 CHARACTERS PER SECOND EPSON.

LIMITED QUANTITY!

TO ORDER CALL (817) 539-2000

JOHNSON & JOHNSON COMPUTER CORP.

2229 EAST LOOP 820 NORTH, FT. WORTH, TEXAS 76112

SUPER-FAST! Z80 Relocating Macro ASSEMBLER \$169.95

Directly generates COM, HEX, or REL files. Flexible REL format allows external bytes and words with complete math operations on them (Microsoft format optional). Features Zilog mnemonics with nested macros, conditionals and include files. Unique one-pass design generates compact intermediate code which is then processed to resolve forward references, yielding tremendous time savings. Complete listing, symbol table and cross-reference output may be sent to any device. The perfect tool for assembly language programming. Linker included. Manual only — \$30. For Z80 CP/M and TRS-80.

SLR Systems

1622 NORTH MAIN ST. • BUTLER, PA 16001 • (412) 282-0864

Shipping \$3 U.S., others \$7. PA + 6%. Check, MO, VISA, M/C, C.O.D.
Most formats available. Dealer and OEM inquiries invited.
Z80, CP/M, TRS-80 TM's of Zilog, Digital Research, Tandy Corp.

✓340

MAP now holds the wild card:

3by5

The Complete Personal Information Retrieval System for Microcomputers

Features Include:

- 3by5 editor/search program you use like a card file
- Enter, modify or delete records while searching
- Index automatically updated
- Rapidly search large data and text files in seconds
- No coding required
- Interactive Help File included
- Demonstration data and text files
- Maintenance policy to keep MAP updated
- Complete documentation

MAP is Available For Use On:

- TRS-80 Model II TRSDOS¹, 64K
- TRS-80 Model III TRSDOS or LDOS², 48K
- Apple IIe³ CP/M⁴, 64K
- All versions require 1 disk drive

¹Tandy Corp. ²TM Logical Systems, Inc. ³TM Apple Computer, Inc.
⁴TM Digital Research, Inc.

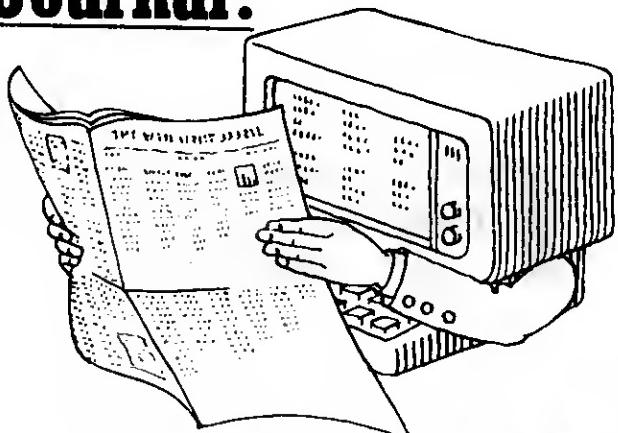
Complete MAP package for only \$125.00
Abridged introductory version for \$35.00

SOFTSHELL™

The Small Computer Specialists for Professionals
P.O. Box 18522, Baltimore, MD 21237

✓57

What if your VisiCalc® could read the Wall Street Journal?



It can with VIS\Bridge/DJ™ from Solutions, Inc.

You can make even better investment decisions by using the power of VisiCalc on current Wall Street data from Dow Jones. With VIS\Bridge/DJ you can transmit data from Dow Jones News/Retrieval® directly into your VisiCalc spreadsheet. DJ eliminates manual entry and provides a fast way to evaluate portfolios and make investment decisions. Includes Dow Jones terminal capability with auto dial and auto signon.

Requires modem and subscription to Dow Jones News/Retrieval. Available for TRS-80¹, I, II/16, III, Apple², II+, III and IBM³ PC.

**\$295. Phone 802 229 0368 from Solutions, Inc. 97 College St.
Box 989, Montpelier, VT 05602
or contact your dealer.**

VIS\Bridge/DJ™ is a trademark of Solutions, Inc. VisiCalc® is a trademark of VisiCorp. TRS-80® is a trademark of Tandy Corp. IBM™ PC is a trademark of IBM Corp. Apple® is a trademark of Apple Computers, Inc. Dow Jones News/Retrieval® and The Wall St. Journal are trademarks of Dow Jones & Co., Inc.

✓276

The Versatile Microprism

by Bradford N. Dixon
80 Micro Technical Editor

The IDS 480 Microprism provides the best features of a dot-matrix tabletop printer and adds the option of near-letter-quality output.

★★★★

The Microprism Printer
IDS Model 480
Integral Data Systems Inc.
Route 13
Milford, NH 03055
Models I and III
\$649

Most printers fall into two categories: letter-quality printers that give a clean, professional appearance to correspondence and other writing projects, and dot-matrix printers with graphics capabilities and other options found only on these units.

Previously, you had to make a choice

between these two types of printers. But the Microprism IDS 480, a dot-matrix printer with a near-letter-quality mode, gives you the flexibility to satisfy most of your printer needs.

Physical Description

The IDS 480 printer (see Photo 1) is an 18.7-pound tabletop unit nearly 16 inches wide, 11½ inches deep, and 4½ inches high. It accommodates 9½-inch fanfold paper, cut sheet paper, and roll paper (mounted on a roller at the rear of the printer). The stepper motor feeds paper at a maximum rate of 3½ inches per second.

The Microprism's case is white with a black dust cover and a clear plastic window for watching text and graphics as they are printed. The dust cover comes

off to facilitate ribbon replacement and to set the DIP (dual in-line package) switches.

When the IDS 480 is viewed from the front (see Photo 2), the printer control panel is on the right. It features a red power indicator light, a green on-line/fault indicator, an on-line/off-line switch, a form-feed switch, and a line-feed/self-test switch.

As you look at the top of the printer with the dust cover removed, you can see the print head strike control lever within easy reach. The snap-in ribbon cartridge and mode-select DIP switches are also accessible.

The platen release lever is at the right rear of the printer's top surface. The power switch and a 25-pin EIA (Electronic Industries Association) interface connector are on the Microprism's rear panel. You can connect this plug to your computer via a serial EIA interface, RS-232C, or a parallel TTL (transistor-transistor logic), Centronics-compatible interface.

Performance

The IDS 480 Microprism is loaded with useful print controls that you won't find in many comparably priced dot-matrix printers.

As a serial printer, the Microprism offers switch-selectable data rates of 300, 1,200, or 9,600 bits per second. It also provides an automatic multiple-line buffer of approximately 1,400 bytes.

The IDS 480 supports the full 96-character ASCII set with true uppercase and lowercase characters. Characters are available in two fonts, near-letter-quality and draft quality, at the flip of a switch.

The printer formats the 96 characters in a 24- by 9-dot matrix in the normal mode, 48- by 9-dot in the enhanced mode (double width). You can print up

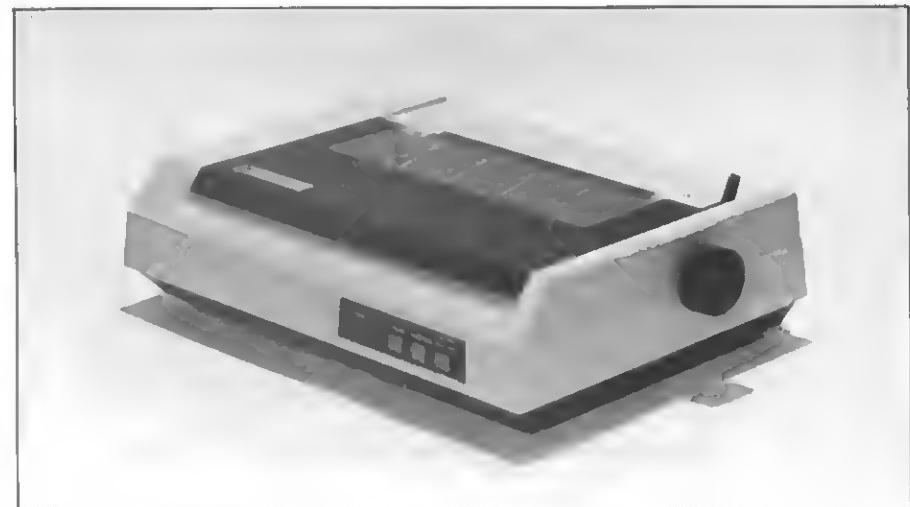


Photo 1. The Microprism Printer.

ACCOUNTING SOFTWARE

for Portable, Personal and Desktop Computers

Available for three popular 8-bit and 16-bit microcomputer formats:

All CPM® 8" Computers (SO)
 All IBM PC Compatibles
 TRS-80 Model 2 (with CPM)
 TRS-80 Model 4 (with CPM)
 Apple II (with CPM)
 Apple III (with CPM)
 Franklin ACE (with CPM)
 Morrow Micro Decision
 Northeast Advantage
 Corona PC & Portable
 Corona Portable
 COMPAQ Portable
 Hyperion Portable
 Seque Chameleon
 TI Professional
 Columbia MPC
 Osborne Executive
 Osborne I (SO)
 Osborne I (DO)
 DEC VT100
 CompuPro
 Xerox 820
 IBM PC
 IBM XT
 KayPro II
 KayPro 10
 Call about
 other formats



"...for several years the defacto standard for microcomputer software, and still a good example of some of the better thought-out software on the market." —Interface Age

SATISFACTION
GUARANTEED
or Your
Money Back

Complete
Package of
Software,
Training Aids,
Manuals, and
User's Newsletter

ONLY
\$395
CP/M format
\$495
IBM format

A Complete System!

Includes all four standard general accounting programs:

GENERAL LEDGER is completely integrated to automatically post end-of-month transactions from A/R, A/P and Payroll. It prints 13 detailed reports for the entire company, and optional Income Statements for up to 99 departments. It produces up-to-the-minute comparative financial statements with current, year-to-date, budget, and last year (month and YTD), showing both dollar amounts and percentages, and presents everything you, your bookkeeper, and your accountant need to know about the company. • G/L automatically reconciles all accounts, and maintains extensive, detailed audit trails showing the source of each G/L entry for quick, easy tracing. • Trial Balance includes all transactions. • Flexible Chart of Accounts. • True double-entry bookkeeping. • Master File capacity: 400 Accounts. • Monthly Transactions capacity: 1,000 with 200K diskette; 3,500 with 500K diskette; 7,000 per Megabyte with a Hard Disk.

ACCOUNTS RECEIVABLE provides instant, on-line customer account information (both current and aged), with complete, timely invoicing, including open-item (or balance forward) and statement capabilities. It makes the entire billing process fast, easy, and efficient. It quickly identifies your overdue accounts, helps speed collections, helps control your cash flow, and assists you in making better financial decisions. Both detailed and summary customer activity and aging reports are instantly available. • Preprinted forms available for invoices and statements. • Detailed audit trail. • Maintains comprehensive customer data files. • Produces 8 reports and documents. • Includes automatic periodic customer/client billing option which is ideal for service businesses. • Itemized monthly transactions. • Master File capacity: 400 Customers. • Monthly Transactions capacity: 800 with 200K diskette; 3,500 with 500K diskette; 7,000 per Megabyte with a Hard Disk.

ACCOUNTS PAYABLE maintains complete vendor/voucher history and includes check-writing capabilities. Current and aged payable reports are available upon command. It prepares an extremely useful cash flow/cash requirements report that greatly improves management control of your most valuable resource—cash! It prints checks (on commercially available forms on which your company name, address and logo can be imprinted) with comprehensive check stubs that your vendors will appreciate. • Produces 11 reports and documents. • Automatic pay selection program allows payment by due date or by discount date. • Manual and automatic checkwriting. • Check register. • Detailed audit trail. • Itemized monthly transactions. • Master File capacity: 400 Vendors. • Monthly Transactions capacity: 800 with 200K diskette; 3,500 with 500K diskette; 7,000 per Megabyte with a Hard Disk.

PAYOUT is a complete, easy-to-use professional-quality payroll system. Be the office hero each week when the checks come out on time! This program calculates payroll for every type of employee (hourly, salaried, and commissioned) and prints payroll checks (with popular, comprehensive check stubs) with an absolute minimum of input. Your company name and logo can appear on these, too. • Stores and reports comprehensive employee and payroll information. • Maintains monthly, quarterly, and yearly totals for reporting purposes in multiple states(!). • Offers user-maintainable Federal, State, and local tax tables(!). • W-2 printing. • 941 Reporting. • Produces 10 reports and documents. • Master File capacity: 400 employees. An outstanding Payroll package!

Produces 42 Reports & Documents:

General Ledger 1. Chart of Accounts 2. Chart of Accounts with summary dollar amounts 3. Chart of Accounts with prior year comparisons 4. Daily Transactions Report 5. Itemized Monthly Transactions 6. Balance Sheet 7. Balance Sheet with prior year comparison 8. Income Statement 9. Income Statement with prior year comparison 10. Departmental Income Statement(s) 11. Departmental Income Statement(s) with prior year comparison 12. Detail report for individual accounts 13. Trial Balance Statement

Accounts Receivable 1. Daily Transactions Report 2. Invoices (with or without preprinted forms) 3. Statements (with or without pre-printed forms) 4. Summary Aging Report 5. Detailed Aging Report 6. Itemized Monthly Transactions 7. Detailed Customer Activity Report 8. Summary Customer Account Report

Accounts Payable 1. Daily Voucher Report 2. Daily Credit Report 3. Checks with Detailed stubs 4. Check Register 5. General Ledger Transfer Report 6. Cash Requirements Report 7. Transaction Register 8. Open Voucher Report 9. Aged Payables Report 10. Detailed Vendor Activity Report 11. Summary Vendor Account Report

Payroll 1. Federal Tax Tables 2. State Tax Tables 3. Payroll checks with stubs 4. Payroll Check Register 5. Monthly Payroll Summary 6. Quarterly Payroll Summary 7. General Ledger Transfer Report 8. Detailed Employee File Listing 9. Produces 941 Worksheet 10. Prints annual W-2 Forms

System Requirements: Either CP/M® or MS-DOS (PC-DOS) • Microsoft BASIC • 64K RAM • Two disk drives or hard disk • 132 column wide carriage printer, or an 8½" x 11" printer with compressed print mode (an Epson MX-80 or similar printer).

100% SATISFACTION GUARANTEE

No-Risk, 30-day Money-Back Guarantee

Order Desktop Accountant and evaluate it yourself for 30 days. Test the performance of each program using our comprehensive Sample Data Files to enter and process data, query accounts, print checks and reports, and more. Review the five User's Manuals, hear the Training Tape, read the users' Newsletter, even call our Technical Support Group with your questions. You must be completely satisfied with Desktop Accountant or you may return it in good condition with the Sealed Master Disk UNOPENED (it installs your live data) for a prompt, courteous, complete refund!



1-800-832-2244

In California call 1-800-732-2311

LETTERS
ON FILE



Technical Support Hotline (8 AM to 5 PM, Mon.-Fri.): (415) 680-8378

Please mention
Ad #120-V

486

Send Orders To: 1280-C Newell Avenue, Suite 147-V, Walnut Creek, California 9456

* When ordering please mention or include the Ad number appearing near our telephone number. • Orders shipped within 48 hours via UPS. • Add \$5.00 for faster 2-day Rush Air Service. • California residents add 6 1/4% Sales Tax. • Payment by VISA/MasterCard/COD/MO/Check. • All Brand Names are manufacturer registered Trade Marks. • No sales to Dealers. • Foreign orders please call or write before ordering. © 1983 Rocky Mountain Software Systems.

MICROSETTE



Buy Direct and Save

- 5 1/4 SS and DS Diskettes
- Soft Sector Format Only



MICROSETTE CASSETTES

- Error-Free Computer Grade
- Industry Leader Since 1977

For Tandy, Apple, Osborne, IBM, Atari, Texas Instruments, Commodore, Timex, Kaypro, Sinclair and Many Others.

CASSETTES

Item	10 Pack	Qty	50 Pack	Qty	Total
C-10	\$ 7.50		\$32.50		
C-20	9.00		39.00		
C-60	11.00		50.00		
C-90	15.00		70.00		

DISKETTES 5 1/4-inch

SSDD	\$25.00	\$100.00	
DSDD	35.00	150.00	
Subtotal			
Shipping & Handling	N/C		
Calif. Cust. add Sales Tax			
Total			

Shipping Address Enclosed
 Check Enclosed
 Visa MasterCard
 Card # _____
 Exp. Date _____
 Signature _____

v312

MICROSETTE CO.

475 Ellis St. Dept. 2
 Mountain View, CA 94033
 (415) 968-1604



Photo 2. Front view of the IDS 480.

```
! "*$%&' ()*+, -./0123456789 : ; <=>?@ABCDEFIGHIJKLNMNOPQRSTUVWXYZ`_`ab
cde`fghi`jkl`mnopqrstuuvwxyz{ } ~#■
```

10 cpi normal

```
! "*$%&' ()*+, -./0123456789 : ; <=>?@ABCDEFIGHIJKLNMNOPQRSTUVWXYZ`_`ab
cde`fghi`jkl`mnopqrstuuvwxyz{ } ~#■
```

10 cpi expanded

```
! "*$%&' ()*+, -./0123456789 : ; <=>?@ABCDEFIGHIJKLNMNOPQRSTUVWXYZ`_`ab
cde`fghi`jkl`mnopqrstuuvwxyz{ } ~#■
```

12 cpi normal

```
! "*$%&' ()*+, -./0123456789 : ; <=>?@ABCDEFIGHIJKLNMNOPQRSTUVWXYZ`_`ab
cde`fghi`jkl`mnopqrstuuvwxyz{ } ~#■
```

12 cpi expanded

```
! "*$%&' ()*+, -./0123456789 : ; <=>?@ABCDEFIGHIJKLNMNOPQRSTUVWXYZ`_`ab
cde`fghi`jkl`mnopqrstuuvwxyz{ } ~#■
```

16.8 cpi normal

```
! "*$%&' ()*+, -./0123456789 : ; <=>?@ABCDEFIGHIJKLNMNOPQRSTUVWXYZ`_`ab
cde`fghi`jkl`mnopqrstuuvwxyz{ } ~#■
```

16.8 cpi expanded

Figure 1. Draft quality ASCII character set.

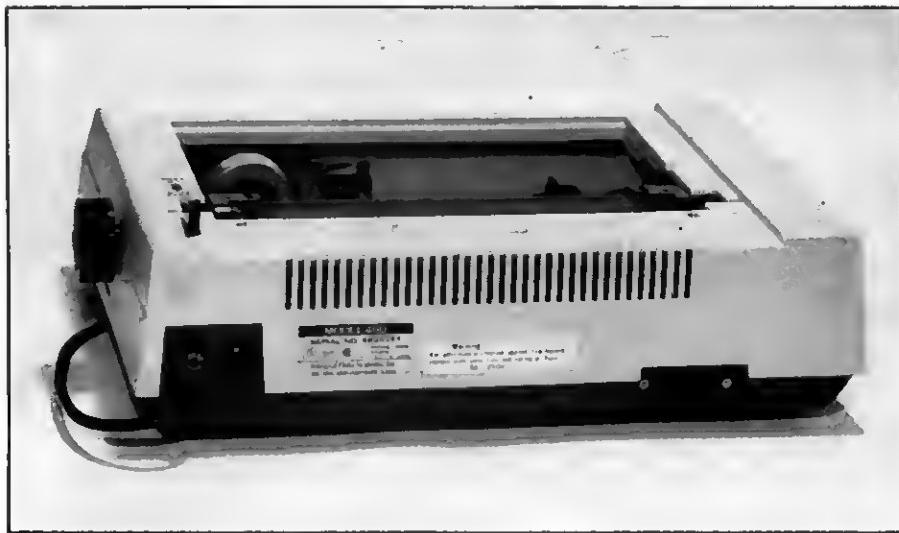


Photo 3. The Microprism's rear panel.

to 110 characters per second (cps) in the near-letter-quality font.

Using the printer's DIP switches, you can select character densities of 10, 12, and 16.8 characters per inch (cpi). See Figs. 1 and 2 for examples of print types.

Maximum line length varies from 80 to 134 characters per 8-inch line, depending on the pitch setting. You can fit more characters on a line by opting for pro-

portional spacing. The printer optionally inserts line spaces as small as 1/48 inch; normal line spacing is 1/12 inch.

Page formatting is software and DIP-switch selectable. Under software control, you can set top and bottom margins in 1/48-inch increments and left and right margins in 1/120-inch increments.

The wide variety of page formats and the quality of print make the IDS 480 a

versatile tool for written documents. I wouldn't use the Microprism for important professional correspondence, resumes, or publication purposes.

But it seems perfectly suited for personal correspondence, interoffice memoranda, manuscripts, reports (with or without graphics), and other written material where letter-quality printing is not a necessity.

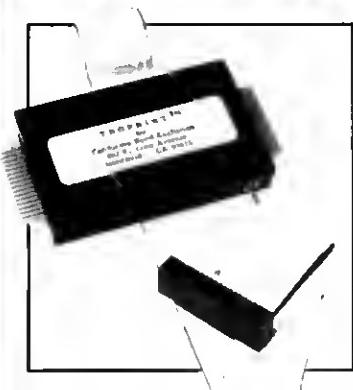
The Microprism printer can be completely software controlled; this is far and away its most significant selling feature. Software control is accomplished with special ASCII control characters.

Program-embedded functions might include character density changes, fixed proportional spacing, automatic text justification, line spacing, page length, margin positions, graphics data, double-width characters, and horizontal and vertical tabs.

The Owner's Manual

Care and feeding of the IDS 480 is a relatively simple matter. All normal maintenance is described in the owner's manual. It contains suggestions such as semiannual cleaning with a lint-free cloth or soft brush and lubrication with a high grade machine oil to keep the

TWO PRINTERS?



TWOPRINT™;
the Smartest Buy
for Making the
Most of
Both of Your
Printers!

\$99.95

(Option available for 3 or
more printers — call for details)

- Hard select of desired printer with toggle switch. Software select mode via CHRS(1) or CHRS(2)
- A red or green light indicates selected printer
- "Centronics" compatible
- TWOPRINT fits the following: MOD I, II, III, IV, 12 & 16 (Please specify as some require changes to your cables)
- Requires purchase of Radio Shack P/N (270-1552 UL Approved) Battery Eliminator

BUY THE BEST!* HARDWARE CLOCK

TRSWATCH I, III & IV™

From the original creator of the TCHRON & TIMEDATE 80.

*remember, this is the Original software & hardware design, not just a cheap copy.

- A Precision, Highly Stable Clock, Time Proven for over 3 years
- Includes factory supported Software on Disk or Tape, a '39.95 value!
- Fully enclosed — Cable prevents breakage when MOD III/IV is tipped up.
- For LNW, Hard Disks, MOD I, MOD III, or MOD IV (specify)
- Requires 2 AAA cells for 3 yr. life
- Applications Program Support is growing. Full support by "TBBS" V1.2



\$99.90

Check or Money Order.
Visa or MasterCard accepted



California residents add 6 1/2% Sales Tax

CALIFORNIA WORD EXCHANGE
802 E. Lime • Monrovia, CA 91016
(213) 443-5866

AVAILABLE FOR
IMMEDIATE SHIPMENT

— DEALERS PLEASE CALL —

✓ 64

unit like new.

Replacing worn ribbon cartridges is a snap because the dust cover comes off for easy access. However, since ribbon life for the Microprism is estimated at more than 1½ million characters, you won't have to do this often.

The manual is a well-written explanation of how to take full advantage of the printer's features. You should carefully study the manual to become cognizant of the valuable features you can call through software control.

The manual is divided into five sections, and provides specific information on running the printer. In addition, it has a handy quick-reference index and a glossary.

Conclusions

With a price tag of only \$649, the IDS Model 480 is a printer well worth the investment. Near-letter-quality characters provide acceptable correspondence text, while the graphics are comparable to or better than other dot-matrix printers in the same price range.

The manual is clear. Service and repair procedures at the Integral Data Systems Inc.'s home office have the customer in mind.

The only problem I encountered during testing was with the printer cable. IDS doesn't have a finished parallel printer cable that connects the printer to a TRS-80 Model I or III.

The cable provided for this review had an adapter card attached that was supposed to fit into the slot where the 25-pin male connector is located. It didn't fit.

At this time, the only way to use the Microprism on a Model I or III is to file

!'"#\$%&'()*+, -./0123456789:;(<=)?@ABCDEFGHIJKLMNPQRSTUVWXYZ[\J]_`abcdefghijklmnopqrstuvwxyz{!}~■

10 cpi normal

!'"#\$%&'()*+, -./0123456789:;(<=)?@ABCDEFGHIJKLMNPQRSTUVWXYZ[\J]_`abcdefghijklmnopqrstuvwxyz{!}~■
■

10 cpi expanded

!'"#\$%&'()*+, -./0123456789:;(<=)?@ABCDEFGHIJKLMNPQRSTUVWXYZ[\J]_`abcdefghijklmnopqrstuvwxyz{!}~■

12 cpi normal

!'"#\$%&'()*+, -./0123456789:;(<=)?@ABCDEFGHIJKLMNPQRSTUVWXYZ[\J]_`abcdefghijklmnopqrstuvwxyz{!}~■
■

12 cpi expanded

!'"#\$%&'()*+, -./0123456789:;(<=)?@ABCDEFGHIJKLMNPQRSTUVWXYZ[\J]_`abcdefghijklmnopqrstuvwxyz{!}~■

16.8 cpi normal

!'"#\$%&'()*+, -./0123456789:;(<=)?@ABCDEFGHIJKLMNPQRSTUVWXYZ[\J]_`abcdefghijklmnopqrstuvwxyz{!}~■

16.8 cpi expanded

Figure 2. Near-letter-quality ASCII character set.

down the card edges to make a tight connection.

The people at IDS are aware of this cable problem and have assured me that it should be remedied before you read this review. You must order the proper

cable for your computer separately.

Aside from the problems I encountered in trying to interface the printer, the Microprism performed well. It is a valuable acquisition if you need a small, reasonably priced, tabletop printer. ■

DISCOUNT COMPUTERS

100% RS COMPONENTS, NO FOREIGN DRIVES OR MEMORY—FULL WARRANTY

8K MODEL 100	\$ 849.00	DMP 100 PRINTER.....	\$ 299.00
24K MODEL 100	799.00	DMP 200 PRINTER.....	599.00
16K MODEL 4	799.00	DMP 500 PRINTER.....	1398.00
64K MODEL 4	1579.00	DMP 2100 PRINTER.....	1599.00
80K MODEL 12, 1 DR.....	2499.00	DWP 410 DAISY	1095.00
80K MODEL 12, 2 DR.....	3149.00	DWP DAISY WHEEL II.....	1599.00
128K MODEL 16, 1 DR.....	3898.00	12 MEG HD MODEL II/12/16.....	2769.00
128K MODEL 16, 2 DR.....	4510.00	ALL RS SOFTWARE.....	20% OFF

CASHIERS CHECK OR MONEY ORDER MUST ACCOMPANY ALL ORDERS.

(817) 825-4027

NOCONA ELECTRONICS • Box 593 • Nocona, TX 76255

✓232

EXTRAORDINARY VALUES

DISK III

Internal floppy disk subsystem for Model III & 4 (includes controller, power supply, cabling, bracket and all associated mounting hardware).

DISK III KIT — Without drive	\$299.95
DISK III KIT — With 1 drive (ss, dd)	449.00
DISK III KIT — With 2 drives (ss, dd)	699.00
EXTERNAL FLOPPY	
DISK DRIVES (ss,dd)	229.00
80 Track or 2 sides	add, per dr 100.00
80 Track and 2 sides	add, per dr 200.00
EXTERNAL Power supply & enclosure only	54.95
VR-RS232C	80.00
Model III & 4 — Direct replacement for 26-1148	

HARD DISK



(5 MEG FIXED)	\$8995.00
5+5 MEG FIXED	1590.00
10 MEG FIXED	1249.00
10+10 MEG FIXED	1999.00
15 MEG FIXED	1449.00
15+15 MEG FIXED	2299.00

MODEL 4



\$1649.00

Model 4 — 64K, 2 drive, VR-RS232C

Equivalent to 26-1069	\$1649.00
16K to 64K RAM upgrade kit	96.00
64K to 128K RAM upgrade (includes PAL)	110.00
PAL only for 64K to 128K upgrade	34.95

ADAPTOR MODULES for: \$ 150.00

TRS-80 Mod I, III, 4, LNW-80, -II,

IBM-PC, -XT, XEROX 820, -II

Coming soon adaptors for Apple-II, IIe, Franklin

Under desk mounting bracket	34.95
Boot ROM for Model III, 4	34.95
Extended Warranty (to 1 year)	150.00

SPECIAL BUYS ON COD & PREPAID ORDERS ONLY:

EPSON FX80, MX80, MX100	CALL	PAPER 9½ x 11 FANFOLD	29.95	DOS-PLUS OPERATING
C ITOH F10	1395.00	PAPER 14½ x 11 GREENBAR	34.95	SYSTEM
C ITOH TRACTOR	225.00	PRINTER CABLES	25.00	VERBATIM 525-01
MX80 RIBBON	9.95	OKIDATA MICROLINE 82A	429.00	DC HAYES
MX100 RIBBON	19.95	OKIDATA MICROLINE 83A	699.00	SMARTMODEM 300
C ITOH & DIABLO RIBBONS	7.50	PERCOM DOUBLER II	169.00	DC HAYES
EPSON GRAPHTRAX	75.00	PERCOM DATA SEPARATOR	29.95	SMARTMODEM 1200
				LNW RESEARCH (FULL LINE) CALL

Call Toll Free • 800-345-8102

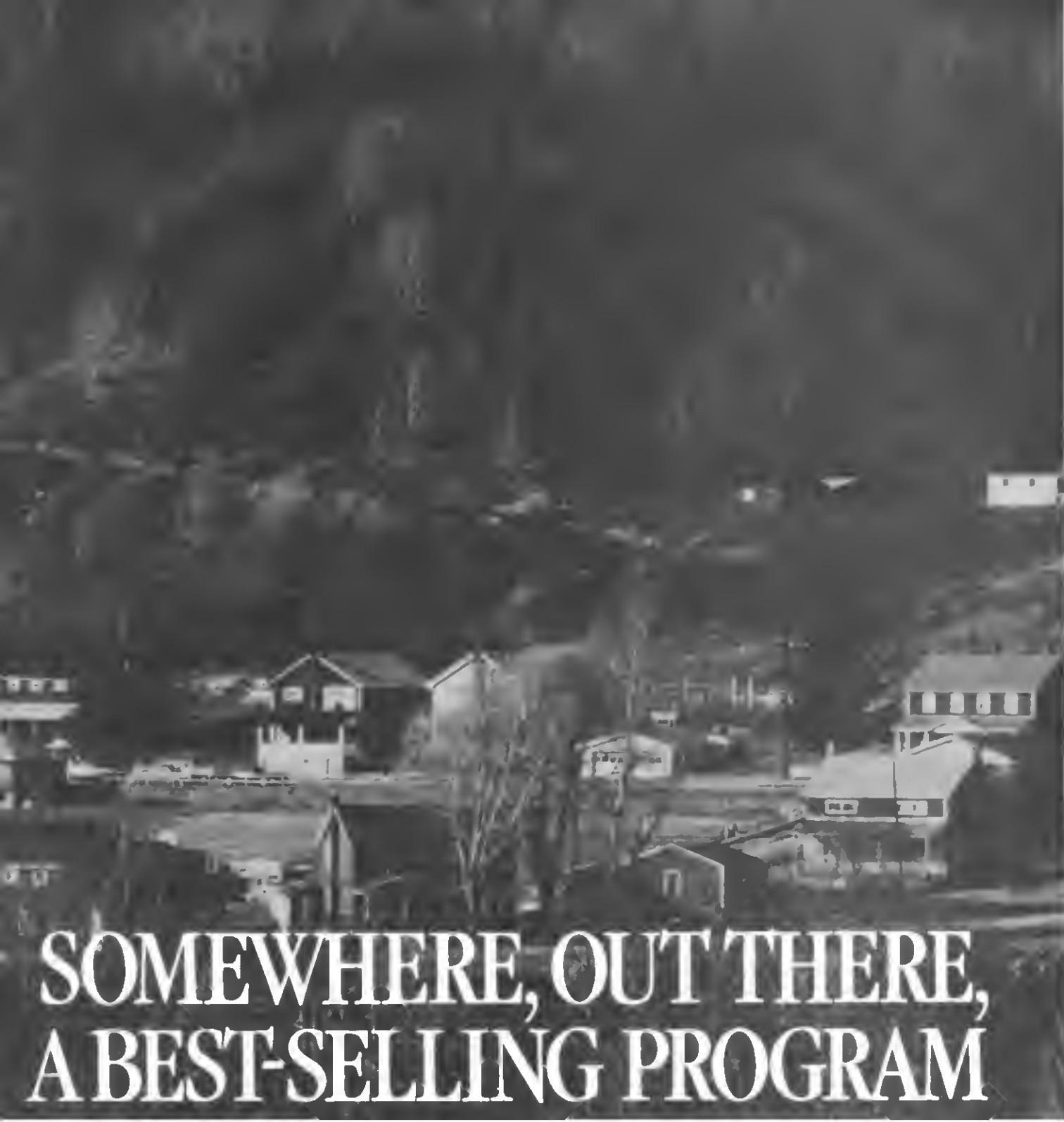
Published prices reflect cash discount. All prices are subject to change without notice. TRS-80 and TRSDOS are trademarks of Tandy Corp.
Telephone Hours: 8:30am—7pm MON-FRI., SAT 10-3 EST
CABLE "VRDATA" TELEX 845-124



VR data

(215) 461-5300
777 Henderson Blvd.,
Folcroft, PA 19032

✓ 10
VR DATA — WEST
WATONGA, OK
1-405-623-8664



SOMEWHERE, OUT THERE, A BEST-SELLING PROGRAM

WHERE IS IT?

Wherever it is, we want it. Maybe, just maybe, we're searching for your program, but we'll never find it unless you call us.

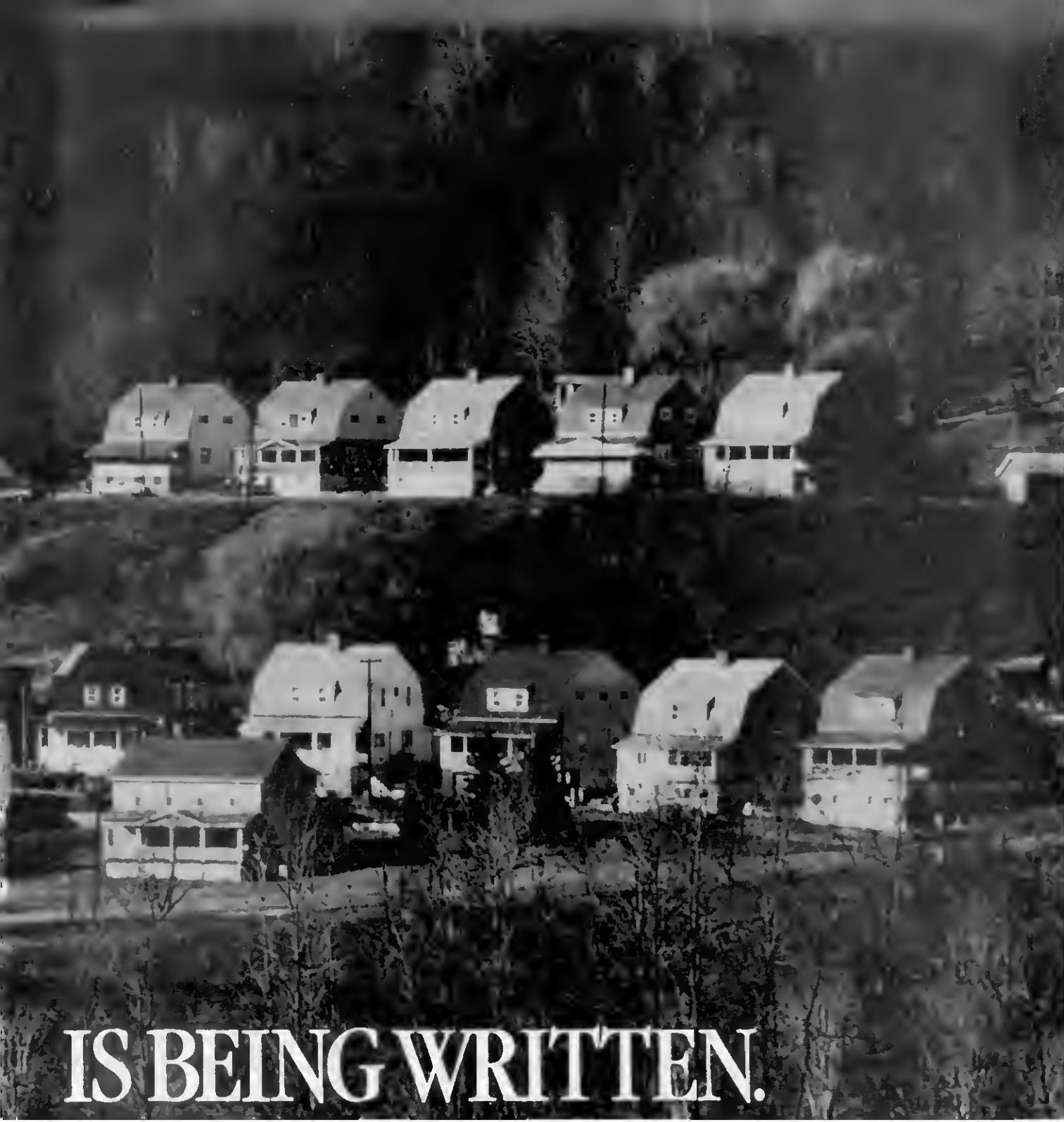
It has to be good, though. Because we're the Software Guild™, an organization devoted to finding the very best microcomputer programs for packaging and distribution under the Softsmith™ label. Hundreds of titles have already been licensed to the Softsmith library. But they're only the beginning. Our goal is to have the best program in major categories on every

popular machine. Of course, we can't do it without you.

If you're a program author or publisher, The Software Guild offers some distinct professional and monetary advantages.

First, you devote your time to what you do best: programming. You can leave the manufacturing, packaging, documentation, distribution and customer service to us.

Second, our revolutionary retail merchandising system will put your program before the public through the normal computer and software stores, plus record outlets, department stores, book shops, and more places where software has never before been available.



IS BEING WRITTEN.

Third, is royalties. Wider distribution means more substantial royalties. And, your Software Guild royalties start to accrue when the dealer makes his purchase in quantity, so you aren't left waiting while money trickles in.

Fourth is flexibility. We do not insist on the exclusive rights to your program. You can deal with other publishers and distributors, or market your program yourself, while it is in Softsmith distribution.

We know you're out there, working and dreaming, and we want to help make your dream come true. Our full staff of professional evaluators are waiting to review your best-seller.

**So call us, wherever you are.
Contact Regina Roberts at (415) 487-5200.**

**Or write:
The Software Guild
2935 Whipple Rd.
Union City, CA 94587**



The Software Guild
(415)487-5200



Project Assessment Technique

by David A. Plyer

Should you buy that roll-top desk and install new carpeting in the office? This program helps you appreciate depreciation in advance.

Project Assessment		
* 1 Non-depreciable capital	:	750.00
2 Depreciable capital	:	4925.00
3 Expense (A)	:	3500.00
4 Expense (B)	:	75.00
5 Product inventory	:	
6 Net salvage	:	
7 First year net income	:	7500.00
8 Second year net income	:	8000.00
9 Third year net income	:	9500.00
10 Fourth year net income	:	9500.00
11 Fifth year net income	:	9500.00
12 Income tax rate (%)	:	43.00
13 Investment credit (%)	:	10.00
14 IRR (%)	:	58.10

Figure 1. Sample worksheet.

Program Listing

```

1000 : PROJECT ASSESSMENT TECHNIQUE
1010 : SOFTWARE TECHNOLOGIES
1020 :
1030 :
1040 : THIS PROGRAM COMPUTES INTERNAL RATE OF RETURN
1050 :
1060 :
1070 CLS
1080 CLEAR 150
1090 DIM V(14)
1100 V(12) = 43.00
1110 V(13) = 10.00
1120 AS = CHR$(230)
1130 TTL$ = "PROJECT ASSESSMENT"
1140 A = -1
1150 I = 1

```

Listing continued

Project Assessment Technique (PAT) is a Level II Basic program for the TRS-80 Model I/III computer equipped with 16K of memory. It calculates the rate of return on an investment and lets you play "what if" games that help you choose between several business alternatives.

PAT displays a worksheet of 14 lines. You enter data about your project into the first 13 lines. PAT then computes the internal rate of return (IRR) based on your information and puts the answer in line 14. This number is a summary of the facts of your proposal, which you can compare with the IRRs of other projects. The larger the percent, the more desirable your venture.

PAT makes these assumptions:

- The project must prove itself within five years.
- All start-up expenditures occur at the same time.
- Capital is recovered at the rate of 20 percent per year.
- Product inventory is recovered fully in year five.

The Worksheet

PAT displays the worksheet shown in Fig. 1.

The mode indicator is < >. In addition to AUTO, there is MANL for

The Key Box

**Model I or III
16K RAM
Cassette or Disk Basic**

manual mode, PRNT for printing, and CALC for calculating the IRR percent. See the commands section for an explanation of these indicators.

The asterisk is the marker. It tells you where next to enter data. In the Auto mode the marker automatically advances to the next line when you press the enter key. You may move it up and down with the appropriate arrows (see Commands).

You can enter a title of up to 35 characters long. The title is automatically centered when you hit the enter key.

Line 1, Non-depreciable Capital, is the sum of all non-depreciable capital associated with a project. Examples include buildings and land improvements (items that do not wear out).

Line 2, Depreciable Capital, is the sum of all depreciable capital needed to start a project. This includes tools, furniture or machinery (items that wear out). The total is fully recovered in a straight-line fashion over five years.

Line 3, Expense (A), is the sum of all development costs, supplies, and so on necessary to initiate a project. Line 4, Expense (B), is the same as line 3. PAT adds Expenses A and B and treats them as one. They are shown as separate items for your convenience.

Line 5, Product Inventory, is the sales value of items produced but not yet sold. This is an annual average assumed to remain fixed during the five-year life of the project. It is non-depreciable and is fully recovered in year five.

Line 6, Net Salvage, is the difference between the value received for facilities made obsolete by the new project and the cost to remove them. If cost exceeds value received then enter a negative number.

Lines 7-11, Net Income, are the forecast of the income this project will generate. The amount entered in each line is the difference between income and expenses for wages, taxes, and so on in the corresponding year.

Line 12, Income Tax Rate (percent), is the corporate tax rate on income. Unless you enter another value, PAT uses 43 percent. Consult the IRS for the latest information.

Line 13, Investment Credit (percent), is a one-time tax deduction based upon the amount of depreciable capital invested in line 2. PAT assumes a tax credit of 10 percent. Consult the IRS for the current tax credit on capital having a five-year life.

Line 14, IRR (percent), is your barometer for the project. It summarizes the first 13 lines of the worksheet. The

Listing continued

```

1160    I1 = 1
1170    K = 1
1180    K1 = 0
1190    K2 = 0
1200    K3 = 1
1210    K4 = 0
1220    '
1230    '
1240    ' TITLE PAGE
1250 PRINT@276,"PROJECT ASSESSMENT TECHNIQUE";
1260 PRINT@351,"P A T";
1270 PRINT@795,"A PRODUCT OF"
1280 PRINT@854,"SOFTWARE TECHNOLOGIES";
1290 PRINT@926,"1981";
1300    '
1310 FOR J = 1 TO 100
1320   MS = INKEYS
1330   IF MS <> "" GOTO 5870
1340 NEXT J
1350 K3 = K3 * -1
1360 IF K3 > 0 GOTO 1400
1370 PRINT@ 532, CHR$(250);
1380 GOTO 1310
1390    '
1400 PRINT@ 532, "PRESS SPACE BAR TO CONTINUE";
1410 GOTO 1310
1420    '
1430    '
1440    ' DISPLAY WORKSHEET
1450 PRINT@INT(((35-LEN(TTLS))/2))+9,TTLS
1460 PRINT@ 70," 1 NON-DEPRECIABLE CAPTL :"
1470 PRINT@134," 2 DEPRECIABLE CAPITAL :"
1480 PRINT@198," 3 EXPENSE (A) :"
1490 PRINT@262," 4 EXPENSE (B) :"
1500 PRINT@328," 5 PRODUCT INVENTORY :"
1510 PRINT@390," 6 NET SALVAGE :"
1520 PRINT@454," 7 1ST YEAR NET INCOME :"
1530 PRINT@518," 8 2ND YEAR NET INCOME :"
1540 PRINT@582," 9 3RD YEAR NET INCOME :"
1550 PRINT@646," 10 4TH YEAR NET INCOME :"
1560 PRINT@710," 11 5TH YEAR NET INCOME :"
1570 PRINT@774," 12 INCOME TAX RATE(%) :"
1580 PRINT@838," 13 INVESTMENT CREDIT(%) :"
1590 PRINT@902," 14 IRR(%) :"
1600    '
1610    '
1620    ' INITIALIZE VALUES IN WORKSHEET
1630 FOR I=1TO 14
1640   PRINT@ (64 * I + 35), A$;
1650   IF V(I) = 0 GOTO 1730
1660   IF I <> 14 GOTO 1710
1670   PRINT@ 931, ;
1680   PRINTUSING "#####.*"; V(14);
1690 GOTO 1730
1700    '
1710   PRINT@ (64 * I + 35), ;
1720   PRINTUSING "#####.*"; V(I);
1730 NEXT I
1740    '
1750    ' POSITION MARKER (*)
1760 I = 11
1770 GOTO 1810
1780    '
1790 I = 1
1800    '
1810 PRINT@ (64 * I + 7), "**";
1820    '
1830    ' DETERMINE MODE <>
1840 IF A > 0 GOTO 1880
1850   PRINT@ 58, "<AUTO>";
1860   GOTO 1930
1870    '
1880 PRINT@ 58, "<MANL>";
1890 GOTO 1930
1900    '
1910    '
1920    ' KEYBOARD SCAN ROUTINE
1930 MS = INKEYS
1940   IF MS <> "" GOTO 2090
1950   GOSUB 2000
1960   GOTO 1930
1970    '
1980    '
1990    ' MARKER FLASH SUBROUTINE
2000   FOR X = 1 TO 20
2010   NEXT X
2020   K3 = K3 * -1
2030   IF K3 < 0 GOTO 2070
2040   PRINT@ (64 * I + 7), " ";
2050   RETURN
2060    '
2070   PRINT@ (64 * I + 7), "**";
2080   RETURN

```

Listing continued

The following are multi-key commands. Key in amount then press
 enter to save amount keyed in
 clear to erase amount keyed in
 $+ - */$ to modify a value by amount keyed in
 I to inflate income from * to year five by amount keyed in

The following are single key commands. Just press
 A to disable or enable automatic mode
 C to compute IRR (%)
 D to duplicate income from * to year five
 E to end program and clear screen
 H to recall instructions—press space bar to continue
 P to print contents of screen
 R to reset all values to 0 or default amounts
 T to revise title
 Up/Down arrow to move * up and down

Table 1. PAT commands.

larger the value, the more attractive the proposal is. If you were to take each year's income, adjust it for taxes and tax credits (lines 12 and 13), discount it by the IRR (percent), and add them together, their sum would equal your total investment in lines 1-6.

Entering Data

PAT operates in the Auto mode unless you tell it otherwise (see Commands). In this mode all entries are made by keying in a number and then hitting enter. The value is automatically right-justified and the marker (*) moved to the next line. To skip a line just hit enter. Continue entering data until you reach line 13. Now when you hit enter, PAT computes the IRR,

Listing continued

```

2090 '
2100 '
2110 FOR X% = 40 TO 57      :****(0-9)****
2120   IF M$ <> CHR$(X%) GOTO 2150
2130   K = K + 1
2140   GOTO 4380
2150 NEXT X%
2160 '
2170 IF M$ <> ". " GOTO 2240: '
2180   IF K1 <> 0 GOTO 1930: '
2190   K1 = 1
2200   K2 = 1
2210   K = 1
2220   GOTO 4460
2230 '
2240 IF M$ <> "T" GOTO 2400: '
2250   K = 0
2260   K1 = 1
2270   K2 = 0
2280   I1 = I
2290   I = 0
2300   TS = ""
2310 PRINT@ (64 * I1 + 7), " ";
2320 IF V(I1) <> 0 GOTO 2360
2330   PRINT@ (64 * I1 + 35), A$;
2340   GOTO 6570
2350 '
2360 PRINT@ (64 * I1 + 35), ;
2370 PRINTUSING "#####.#"; V(I1);
2380 GOTO 6570
2390 '
2400 IF MS = "E" GOTO 7000: '
2410 IF MS <> CHR$(31) GOTO 2590: '
2420   IF TS = "" GOTO 1930
2430   PRINT@ (64 * I + 35), A$;
2440   IF V(I) = 0 GOTO 2530
2450   IF I <> 14 GOTO 2500
2460     PRINT@ 931, ;
2470     PRINTUSING "#####.#"; V(14);
2480   GOTO 2530
2490 '
2500 PRINT@ (64 * I + 35), ;
2510 PRINTUSING "#####.#"; V(I);
2520 '
2530 GOSUB 4720
2540 K2 = 0
2550 '
2560 IF I = 14 AND A < 0 GOTO 1790
2570 GOTO 1930
2580 '
2590 IF MS <> "H" GOTO 2630: '
2600   GOSUB 4720
2610   GOTO 5870
2620 '
2630 IF MS <> "C" GOTO 2700: '
2640   PRINT@ (64 * I + 7), " ";
2650   PRINT@ 58, "<CALC>";
2660   GOSUB 4720
2670   I1 = I
2680   GOTO 4860
2690 '
2700 IF MS <> "R" GOTO 2830: '
2710   I1 = 1

```

"Unlike the multi-key commands...single-key commands are immediate."

displays the answer in line 14, and returns the marker to line 1. This is the simplest way to use PAT. Refer to the next section, Commands, for a more versatile approach.

Commands

PAT recognizes 17 commands. They are summarized in Table 1 and can be recalled at any time by typing H for help.

Use multi-key commands when entering data. They are multi-key because you first type DATA, then press the enter key to accept the value keyed in. This also advances the marker in the Auto mode.

Press clear to erase the value keyed in and reinstate the current amount.

Press $+ - */$ to modify a value by an amount just keyed in. For example, if line 9 is currently 2,500 and you wish to reduce it by 25 percent just type .75*. PAT automatically multiplies 2,500 by .75 and displays 1,875. Addition, subtraction, and division work the same way: Key in the operator, then the modifier. You don't have to use the shift key for multiplication or addition.

Press 1 to inflate income forecasts (lines 7-11) from the marker to the fifth year (line 11). For example, if the forecast in lines 7-11 is to be inflated by 2 percent annually, first put the

Listing continued



Every Z80 assembly-language programmer needs this book.

Programming in assembly language requires good tools. *TRS-80/Z80 Assembly Language Library*, a complete reference book on TRS-80 Model I assembly language, is the best tool you can find. In over 300 pages, 45 figures, and 75 program listings, author Craig A. Lindley explains the details of Model I hardware and software and shows you how to write programs that squeeze every bit of performance out of your computer. This book will teach you:

- how to use ROM and DOS routines in your own programs
- how to perform disk input/output
- how to access the video display and keyboard
- how to write easy-to-use programs
- how to perform arithmetic operations
- how to use the undocumented Z80 instructions

You'll also learn about disk operating systems, device handling, base conversion, parameter passing, and more.

TRS-80/Z80 Assembly Language Library contains a library of ready-to-run utility programs that are worth many times the book's cost. Included with the book are two Model I TRSDOS-compatible disks* containing utilities for printer formatting and spooling, single-key entry of strings, disk editing, base conversion, password encoding and decoding, and more. You get more than 15 valuable utilities, and the source code files are included, so you can examine, modify, and learn from every program.

Many of the programs also run on the Model III,

and those that do not require only minor modification. One of the book's four sections is dedicated to routines and programs that run on any Z80-based system. No matter what Z80 computer you program, this book has something for you.

It's a book that's designed to be used. The text is set in large type, and the book is bound in an 8½ × 11-inch easel-backed binder that stands up next to your computer. So there's no squinting at tiny type and fighting to keep the book open.

The whole package—book, disks, and binder—is yours by mail for the introductory price of only \$29.97. And if you charge it, you can even call toll-free to order. Reserve your copy now, because after October 31, the price will be \$34.97.

TRS-80/Z80 Assembly Language Library. It's the assembly-language book for the '80s.

*Disks do not contain a disk operating system; two disk drives or a disk copy utility are required to transfer the files.

Call **Toll-Free 1-800-258-5473** for credit card orders or send \$29.97 plus \$4.50 shipping and handling to Wayne Green Books, Retail Sales, Peterborough NH 03458. Dealer inquiries invited.

I need *TRS-80/Z80 Assembly Language Library*.

Send me _____ copies of *TRS-80/Z80 Assembly Language Library* (BK7395-01) @ \$29.97 each. I have enclosed \$4.50 per system for shipping and handling.

MasterCard VISA AmEx payment enclosed

Card # _____ Expires _____

InterBank# _____ Signature _____

Name _____

Address _____

City _____ State _____ Zip _____

339B8L

marker on line 7. Then type 2 and press I. PAT automatically calculates the inflated amount (compounds annually) and displays the new values in lines 8-11. The line addressed by the marker is assumed to be year zero in the compound interest formula and does not change.

Unlike the multi-key commands that require a two-step operation, the single-key commands are immediate. Just press one of these keys (do not press enter).

Press A to change from the automatic mode to the manual mode and back. Each time you press A the message in the upper right corner of the screen confirms the new mode. For example, AUTO tells you that you are in the automatic mode. Pressing the A key puts PAT into the manual mode and MANL appears in the upper right corner of the display. In the manual mode the only way to move the marker is with the up and down arrows. The manual mode allows you to move the marker to line 14. This lets you enter a desired IRR percent while PAT computes and displays the net incomes necessary to achieve it in lines 7-11. Pressing A again returns you to AUTO.

Sophisticated Moving Averages System **SMAS** Stock Market Advisor System

SMAS is a stock market program with a difference. SMAS uses both fundamental principles and technical analysis. Its refined algorithms using three moving averages are validated by applications both to individual stocks and to portfolios.

- Sophisticated algorithms yield weekly appraisals of market trend and recommendations to buy, sell, and hold individual stocks
- Data base consists of 196 stocks and 4 indexes
- Data base stocks selected for growth history and potential; volatility, and trading activity
- Data bases are current; you get meaningful results the very first week you use SMAS
- Data required by SMAS are readily available
- Program is menu driven, user friendly, with needed utilities and built-in checks for accuracy
- SMAS is especially suited for those seeking long term capital gains
- SMAS reduces emotional involvement in the market
- SMAS works with TRSOOS, NEWDOS/90, LDOS & DOSPLUS with TRS-80 (TM Tandy Corp.) Models I and III. State Model and number of tracks in disk drives.

SMAS \$169.95 — Include \$3.00 for packing and shipping or \$6.50 for Priority Mail. Texans add 5% sales tax. Cashier's check or money order brings prompt shipment; personal check requires three weeks to clear.

Or send SASE for further information.

SPIRAL ENTERPRISES

P.O. Box 5219, Fort Worth, TX 76108
308 Crown Road, Willow Park, TX 76086 ✓92
DEALER INQUIRIES INVITED

Listing continued

```

2720      GOSUB 4720
2730      A = -1
2740      FOR X = 1 TO 11
2750      V(X) = 0
2760      NEXT X
2770      V(12) = 43.00
2780      V(13) = 10.00
2790      V(14) = 0
2800      PRINT@ (64 * I + 7), " ";
2810      GOTO 1620
2820
2830      IF M$ <> CHRS(10) GOTO 3170:   **DN ARROW*
2840      IF TS = "" GOTO 2870
2850      PRINT@ (64 * I + 35), AS;
2860
2870      IF I <> 14 GOTO 2930
2880      IF V(14) = 0 GOTO 2930
2890      PRINT@ 931, ;
2900      PRINTUSING "#####.##"; V(14);
2910      GOTO 2970
2920
2930      IF V(I) = 0 GOTO 2970
2940      PRINT@ (64 * I + 35), ;
2950      PRINTUSING "#####.##"; V(I);
2960
2970      PRINT@ (64 * I + 7), " ";
2980
2990      IF A > 0 GOTO 3070
3000      IF I <> 13 GOTO 3070
3010      IF M$ <> CNRS(13) GOTO 3070
3020      PRINT@ 839, " ";
3030      I = 1
3040      MS = "C"
3050      GOTO 2630
3060
3070      I = I + 1
3080      GOSUB 4720
3090
3100      IF A > 0 GOTO 3140
3110      IF I <= 13 GOTO 1810
3120      GOTO 1790
3130
3140      IF I > 14 GOTO 1790
3150      GOTO 1810: '
3160
3170      IF M$ <> CHRS(91) GOTO 3430:   **UP ARROW*
3180      IF TS = "" GOTO 3210
3190      PRINT@ (64 * I + 35), AS;
3200
3210      IF I <> 14 GOTO 3270
3220      IF V(14) = 0 GOTO 3270
3230      PRINT@ 931, ;
3240      PRINTUSING "#####.##"; V(14);
3250      GOTO 3310
3260
3270      IF V(I) = 0 GOTO 3310
3280      PRINT@ (64 * I + 35), ;
3290      PRINTUSING "#####.##"; V(I);
3300
3310      PRINT@ (64 * I + 7), " ";
3320      I = I - 1
3330      GOSUB 4720
3340
3350      IF I >= 1 GOTO 1810
3360      IF A >= 0 GOTO 3400
3370      I = 13
3380      GOTO 1810
3390
3400      I = 14
3410      GOTO 1810
3420
3430      IF M$ <> "D" GOTO 3610:    *** ( D ) ***
3440      IF TS <> "" GOTO 3610
3450      IF I < 7 GOTO 3840
3460      IF I > 11 GOTO 3840
3470      FOR X = I TO 11
3480      V(X) = V(I)
3490      PRINT@ (64 * X + 35), AS;
3500      IF V(X) = 0 GOTO 3530
3510      PRINT@ (64 * X + 35), ;
3520      PRINTUSING "#####.##"; V(X);
3530      NEXT X
3540      PRINT@ 932, AS;
3550
3560      IF A > 0 GOTO 1810
3570      PRINT@ (64 * I + 7), " ";
3580      I = 11
3590      GOTO 1810
3600
3610      IF M$ <> "I" GOTO 3840:    *** ( I ) ***
3620      IF I < 7 GOTO 1930
3630      IF I > 11 GOTO 1930

```

Listing continued

```

3640      PRINT@ 931, A$;
3650      V = VAL(T$) / 100
3660      FOR X = I TO 11
3670          V(X) = V(X) * ((1 + V) [ (X - I))
3680      NEXT X
3690
3700      PRINT@ (64 * I + 7), " ";
3710      FOR X = I TO 11
3720          PRINT@ (64 * X + 35), ;
3730          IF V(X) = 0 GOTO 3760
3740          PRINT@ (64 * X + 35), ;
3750          PRINTUSING "#####.##"; V(X);
3760      NEXT X
3770
3780      GOSUB 4720
3790
3800      IF A > 0 GOTO 1810
3810          I = 11
3820          GOTO 1810
3830
3840      IF K = 1 GOTO 4020: BEGIN SIGN TESTS
3850      IF M$ <> "+ AND M$ <> ";" GOTO 3890: '(ADD)***'
3860          V(I) = V(I) + VAL(T$)
3870      GOTO 4540
3880
3890      IF M$ <> "-" GOTO 3930: *** (SUB) ***
3900          V(I) = V(I) - VAL(T$)
3910      GOTO 4540
3920
3930      IF M$ <> "*" AND M$ <> ":" GOTO 3970: '(MLT)***'
3940          V(I) = V(I) * VAL(T$)
3950      GOTO 4540
3960
3970      IF M$ <> "/" GOTO 4020: *** (DIV) ***
3980          IF VAL(T$) = 0 GOTO 2420
3990          V(I) = V(I) / VAL(T$)
4000      GOTO 4540
4010
4020      IF M$ = "--" GOTO 4050: *** ( - ) ***
4030      IF M$ <> "+" AND M$ <> ";" GOTO 4090: '( + ) ***'
4040          MS = "+"
4050          IF K2 <> 0 GOTO 1930
4060          K2 = 1
4070      GOTO 4460
4080
4090      IF M$ <> "A" GOTO 4220: *** ( A ) ***
4100          A = A * -1
4110          IF A < 0 GOTO 4150
4120          PRINT@ 58, "<MANL>";
4130          GOTO 4180
4140
4150          PRINT@ 58, "<AUTO>";
4160          GOTO 4180
4170
4180      IF I <> 14 GOTO 1930
4190          PRINT@ 903, " ";
4200          GOTO 2430
4210
4220      IF M$ <> "P" GOTO 4310: *** ( P ) ***
4230          IF PEEK(14312) >= 128 GOTO 1930
4240          K = 1
4250          K1 = 0
4260          T$ = ""
4270          PRINT@ (64 * I + 7), " ";
4280          PRINT@ 58, "<PRNT>";
4290          GOTO 6320
4300
4310      IF M$ <> CHR$(13) GOTO 1930: ** (ENTER) **
4320          IF T$ = "" GOTO 4540
4330          V(I) = VAL(T$)
4340          GOTO 4540
4350
4360
4370      CONSTRUCT DIGIT STRING
4380      IF K <= 7 GOTO 4460
4390          T$ = "TOO BIG!"
4400          PRINT@ (64 * I + 35), T$;
4410          K = 1
4420          K1 = 0
4430          K2 = 0
4440          GOTO 1930
4450
4460      IF T$ <> "TOO BIG!"      * GOTO 4490
4470          T$ = ""
4480
4490      T$ = T$ + M$;
4500      PRINT@ (64 * I + 35), A$;
4510      PRINT@ (64 * I + 35), T$;
4520      GOTO 1930
4530
4540      PRINT@ (64 * I + 35), A$;
4550      PRINT@ 931, A$;

```

Press C to compute the IRR percent at any time and from any line. When you press C the marker disappears, CALC replaces the mode in the upper right corner of the screen, and a series of numbers flashes in line 14. When the correct IRR percent is found the display remains fixed, the upper right corner again displays the mode, and the marker reappears. This takes about 10 seconds.

Press D to duplicate, through year five (line 11), an income addressed by the marker. For an example, the income level in year two will remain constant through year five. Rather than entering that value over and over, just move the marker to year two (line 8) and press D. PAT automatically places that amount in years 3-5.

Press E to end the session and clear the screen. When you press E the screen clears and Ready appears. You can now enter other programs or run PAT. Pressing the break key has the same effect but does not clear the screen.

Press H to recall the command list. You may press H at any time. Doing so clears the screen and replaces the worksheet with a list and brief descrip-

UO-LISP

AN OPTIMIZING COMPILER
AND ASSEMBLER
AN EXCELLENT SYSTEM
FOR A.I., ROBOTICS,
INTELLIGENCE SYSTEMS

FAST LOAD LIBRARIES:
COMPILED CODE CAN BE STORED IN
RELOCATABLE FILES

INTERPRETER:
OVER 125 FUNCTIONS IMPLEMENTED IN
BASE INTERPRETER.

DOCUMENTATION:
THE MANUAL IS OVER 100 PAGES COVERING
ALL ASPECTS OF THE SYSTEM. NUMEROUS
EXAMPLES OF EACH FACILITY ARE INCLUDED.

SUPPORT SOFTWARE:
LITTLE META-TRANSLATOR WRITING SYSTEM
IS A LISP PROGRAM WHICH PERMITS YOU
TO SPECIFY THE SYNTAX OF A PROGRAMMING
LANGUAGE AND HOW IT IS TO BE INTERPRETED.

REQUIREMENTS:
TRS-80 MODELS I OR MODEL III, 48K. DUAL DISKS
ALSO AVAILABLE FOR CP/M.

ORDERING:
SYSTEM MANUAL... \$20.
COMPLETE SYSTEM... \$160.
LITTLE META MANUAL ONLY... \$16.
LITTLE META TRANSLATOR... \$40.
VISA and MASTERCARD
PLEASE INCLUDE EXPIRATION DATE AND CARD NO.

FW FAR WEST SYSTEMS, SOFTWARE, INC.
P.O. BOX 6582, PALO ALTO 94305
(415) 941-0900

tion of all commands. Then, pressing the space bar reinstates the worksheet as it was before you called for help. If you press H while entering a value, that value is automatically cleared just as though you had pressed C.

Press P to print the screen's contents. You can call for a copy of the worksheet or list of commands at any time. When PAT is printing, PRNT appears in the upper right of the screen.

*"You can call for a
copy of the worksheet
... at any time."*

Press R to reset all values to zero and default amounts. Pressing R at any time sets the values of lines 1-11 and line 14 to zero (zeros appear as blanks). At the same time, the percentages in lines 12 and 13 become 43 and 10, respectively. Finally, the marker is returned to line 1 and PAT shifts to the Auto mode.

Press T to revise the title. Pressing T at any time moves the marker to the title

Business Software

What you're looking for in Business Software . . . we got!!!

- Reliability
- Speed & Efficiency
- Easy Data Entry
- Competitive Pricing

General Ledger \$99.95

- Customize financial statements
- Almost unlimited storage capacity
- Income statement by department
- Reg: 48K Mod 3 or 4, 2 drs & 80cptr.

Accounts Receivable ... \$99.95

- Balance forward A/R
- 30/60/90 day aging
- Late charges & credit limits
- Reg: 48K Mod 3 or 4, 2 drs & 80cptr.

Loan Amortization \$24.95

- Print a loan repayment schedule
- Analyze using diff. int/prin/periods
- Reg: 48K Mod 1, 3 or 4, 1 drive

Income Tax Package(s) ... \$39.95

- Price per package - 4 packages offered
- Save time, print all forms & schedules
- Too numerous to list all forms & schedules
- 48K Mod 1, 3, & 4, 1 dr & 48K Apple II+

Write or Call for FREE catalogue
R & S Software Co.

P. O. Box 81 - Hammond, IN - 46320
(312) 862-4531

Listing continued

```

4560 IF I <> 14 THEN V(14) = 0
4570 IF I = 14 GOTO 4590
4580 IF V(1) = 0 GOTO 4680
4590 IF I <> 14 GOTO 4640
4600 PRINT@ 931, ;
4610 PRINTUSING "#####.##"; V(14);
4620 GOTO 4680
4630 :
4640 PRINT@ (64 * I + 35), ;
4650 PRINTUSING "#####.##"; V(I);
4660 GOTO 4680
4680 GOSUB 4720
4690 GOTO 4800
4700 :
4710 :
4720 K = 1
4730 K1 = 0
4740 K2 = 0
4750 T$ = ""
4760 RETURN
4770 :
4780 :
4790 :
4800 : BEGIN CALCULATIONS FOR ANNUAL INCOME REQUIREMENTS AND IRR%
4810 IF I = 14 GOTO 4850
4820 IF A < 0 GOTO 2840
4830 GOTO 1930
4840 :
4850 PRINT@ 903, " ";
4860 T2 = V(2) * (V(12) / 500) : 'ANNUAL DEPRECIATION OVER 5 YEARS
4870 T3 = 1 - (V(12) / 100) : 'NET TAX RATE
4880 T(1) = (V(3) + V(4)) * (V(12) / 100) : 'INVESTMENT CREDIT($)
4890 T(1) = T(1) + (V(2) * (V(13) / 100)) : 'TOTAL TAX CREDIT($)
4900 V7 = V(1) + V(2) + V(3) + V(4) + V(5) - V(6) : 'TOTAL EXPENDITURES
4910 :
4920 IF MS = "C" GOTO 5290
4930 IF V7 > 0 GOTO 4990
4940 PRINT@ 931, AS;
4950 V(14) = 0
4960 GOTO 1810
4970 :
4980 : CALCULATE EQUAL ANNUAL INCOME REQUIREMENTS FOR GIVEN IRR%
4990 S = 0
5000 FOR Y = 1 TO 5 : ADD DISCOUNT FACTORS FOR EACH OF 5 YRS
5010 S = S + 1 / ((1 + V(14)) / 100) [ Y )
5020 NEXT Y
5030 T = (V7 - T2 * S - T(1) / (1 + V(14) / 100)) / S : 'TOTAL GROSS INCOME
5040 TX = T / T3 : 'TOTAL NET INCOME
5050 IF V(5) > 0 GOTO 5090: 'CALCULATE PRODUCT INVENTORY EFFECT
5060 P1 = 0
5070 GOTO 5120
5080 :
5090 P1 = V(5) / T3
5100 GOTO 5120
5110 :
5120 FOR Y = 7 TO 10
5130 V(Y) = TX
5140 PRINT@ (64 * Y + 35), ;
5150 IF V(Y) = 0 GOTO 5180
5160 PRINT@ (64 * Y + 35), ;
5170 PRINTUSING "#####.##"; V(Y);
5180 NEXT Y
5190 :
5200 V(11) = TX - P1 : 'SUBTRACT INVENTORY FROM YEAR 5 INCOME
5210 PRINT@ 739, AS;
5220 PRINT@ 739, ;
5230 PRINTUSING "#####.##"; V(11);
5240 GOTO 1810
5250 :
5260 :
5270 :
5280 : COMPUTE IRR% USING BINARY SEARCH METHOD
5290 IF V7 > 0 GOTO 5350
5300 PRINT@ 931, "INDETERMINANT";
5310 I = 11
5320 V(14) = 0
5330 GOTO 1810
5340 :
5350 FOR Y = 1 TO 5
5360 S(Y) = V(Y + 6) * T3 : 'COMPUTE NET INCOME
5370 R(Y) = S(Y) + T(Y) + T2 : 'ADD TAX CREDITS AND DEPRECIATION
5380 NEXT Y
5390 :

```

Listing continued

MODEL IV DISK UPGRADE ONLY FROM MICRO MAINFRAME

SHIPPING FROM STOCK

- Our FDC-3B Standard Grade controller is for single-sided disk operation only and does not provide for 8" disk operation.
- Our FDC-3C Premium Grade controller is for double-sided and/or 8" disk drives.

BOTH COMPLETE DISK UPGRADE KITS INCLUDE THE TEC 5" SINGLE SIDED, DOUBLE DENSITY TEC DISK DRIVE. Double-sided drives will be available at extra cost. 8" drives are available from a number of vendors. Please refer according to the stock numbers listed below:

DRIVE UPGRADE KIT INCLUDES CONTROLLER, SWITCHING POWER SUPPLY, INSTALLATION KIT, TEC DISK DRIVE AND COMPLETE INSTRUCTIONS.

FDC-3BKD (Standard Grade Controller)	\$ 349.95
FDC-3CKD (Premium Grade Controller)	\$ 399.95

DISK CONTROLLER PC BOARDS ARE AVAILABLE AS FOLLOWS.

FDC-3B (Standard Grade Controller)	\$ 79.95
FDC-3C (Premium Grade Controller)	\$ 99.95

CONTROLLER UPGRADE KIT (less drive) INCLUDES CONTROLLER, SWITCHING POWER SUPPLY, INSTALLATION KIT, AND COMPLETE INSTRUCTIONS.

FDC-3EK (Standard Grade Controller)	\$ 179.95
FDC-3CK (Premium Grade Controller)	\$ 199.95

MODEL-III COMPUTER COMPLETE WITH DUAL TEC DISK DRIVES, 48K RAM, AND A MICRO MAINFRAME FACTORY INSTALLED DISK UPGRADE KIT.**

M32-1 Model-III** with FDC-3BKD	\$1355.00
M32-2 Model-III** with FDC-3CKD	\$1555.00

THE NEW DS-1A DATA SEPARATOR IS NOW AVAILABLE AND GIVES SUPERIOR DATA SEPARATION AND EXTENDS 5" DISK OPERATION TO ALMOST ANYONE'S DISK CONTROLLER!

If you are having difficulty with your disk controller, the problem may be the data separator. Micro Mainframe can provide data separation in your own disk controller or in selected controllers. We can give you 5" disk capability for FREE!

DS-1A Data Separator \$ 34.95

WHAT IS DIFFERENT ABOUT THE MICRO MAINFRAME CONTROLLER?

- **MICRO MAINFRAME** controllers have features other manufacturers haven't yet thought of.
- **MICRO MAINFRAME** products have been proven over the longest period of time, many in the industry and thousands of units. Thanks to our high volume of production we can offer the highest quality products at the most competitive price in the industry.
- **EVERY MICRO MAINFRAME CONTROLLER PRODUCED HAS GOLD PLATED CARD EDGE CONNECTORS FOR INCREASED RELIABILITY AT NO EXTRA COST.**
- **MICRO MAINFRAME IS FIRST TO USE THE STATE OF THE ART 3215 DATA SEPARATOR (FDC-3C ONLY).** We have proven this data separator for a full year and have used it beginning with the very

first FDC-3C disk controller. Unlike other controllers, NO ADJUSTMENTS ARE EVER REQUIRED TO OUR DATA SEPARATOR.

- **MICRO MAINFRAME IS FIRST TO PROVIDE FOR 8" DISK OPERATION ON BOTH OUR FDC-3A AND FDC-3C MODELS.**
- **MMF GIVES YOU A SYSTEM THAT CAN GROW WITH YOUR NEEDS.** From floppy disk systems to state-of-the-art hard disk systems with full ECC and the industry's only SASI Multilaser with our SASI-NET®.
- **MMF'S NEW 24 PAGE INSTALLATION MANUAL IS SECOND TO NONE.** Installing a disk upgrade kit from **MICRO MAINFRAME** is easier than ever before.

WHO IS MICRO MAINFRAME?

MICRO MAINFRAME is the newest and most respected aftermarket manufacturer of floppy disk controllers for the Model-III**.

MICRO MAINFRAME has introduced a new line of hard disk drives that beat any other manufacturer's line. We are introducing our new families FDC-3 series of disk controllers for the first time.

MICRO MAINFRAME has sold thousands of controllers to many OEM's who have marketed MMF controllers as their own up-

HOW DO I ORDER?

In order to provide the best possible service, the customer **MICRO MAINFRAME** has no drop-off locations. You may either prepay your shipment, or we will ship C.O.D. All orders over \$500 require a home or business placement. All non-certified funds will be held a minimum of 3 weeks to allow them to clear. Shipping and handling charges are extra and are not included in the prices above. **MODEL-III** COMPUTERS** are shipped by truck only. Please phone MMF at 714/850-5100 for shipping and handling fees to your location.

ACCEPT NOTHING LESS THAN THE BEST. INSIST UPON GENUINE MICRO MAINFRAME QUALITY PRODUCTS. Micro Mainframe has a complete line of products for the Model-III** computer system. Call or write for our descriptive flyer.

DEALER INQUIRIES SOLICITED ON YOUR PRINTED LETTERHEAD ONLY.

Phone numbers are acceptable only between 7:30 AM and 5:30 PM Pacific Time.

MICRO MAINFRAME
11325 Sunrise Gold Circle
Building A
Rancho Cordova, CA 95670
(916) 635-3997

```

5400 IF V(5) <= 0 GOTO 5450: '
5410 S(5) = S(5) + V(5)
5420 R(5) = S(5) + T(5) + T2
5430 GOTO 5450
5440 '
5450 LO = 0 :SET LOW LIMIT FOR IRR
5460 HI = 10 :SET HI LIMIT FOR IRR
5470 I = 5 :FIRST GUESS AT IRR
5480 P = 0 :SET TOTAL DISCOUNTED CA
SH FLO TO 0
5490 FOR Y = 1 TO 5
5500 P(Y) = R(Y) / ((1 + I) [ Y ) :DISCOUNT ANNUAL CASH FL
O
5510 P = P + P(Y) :CUMULATE DISCOUNTED CAS
H FLO
5520 NEXT Y
5530 IF ABS(V7 - P) > .01 GOTO 5610: TEST DCF AGAINST TOTAL
INVESTMENT
5540 V(14) = I * 100 :PASS IF DIFFERENCE WITH
IN .01 OF 0
5550 PRINT@ 931, AS;
5560 PRINT@ 931, ;
5570 PRINTUSING "*****.*"; V(14),
5580 I = II
5590 GOTO 1810
5600 '
5610 IF (V7 - P) < 0 GOTO 5650: SET NEW VALUES FOR HI
AND LO
5620 HI = I
5630 GOTO 5680
5640 '
5650 LO = I :NEXT GUESS AT IRR
5660 GOTO 5680
5670 '
5680 I = ((HI - LO) / 2) + LO :DISPLAY IRR IN LINE 14
5690 PRINT@ 931, AS;
5700 PRINT@ 931, I;
5710 '
5720 IF I <= 9.99 GOTO 5760: TEST UPPER LIMIT OF IRR
5730 PRINT@ 932, " >1000% ";
5740 I = II
5750 V(14) = 0
5760 GOTO 1810
5770 '
5780 IF I >= .001 GOTO 5480: TEST LOWER LIMIT OF IRR
5790 PRINT@ 932, " <.1% ";
5800 I = II
5810 V(14) = 0
5820 GOTO 1810
5830 '
5840 '
5850 '
5860 ' DISPLAY LIST OF COMMANDS
5870 CLS
5880 PRINT"THE FOLLOWING ARE MULTI-KEY COMMANDS. KEY IN AMOUNT T
HEN PRESS"
5890 PRINT" ENTER TO SAVE AMOUNT KEYED IN"
5900 PRINT" CLEAR TO ERASE AMOUNT KEYED IN"
5910 PRINT" +-*/ TO MODIFY A VALUE BY AMOUNT KEYED IN"
5920 PRINT" I TO INFLATE INCOME FROM * TO YR 5 BY AMOUNT
KEYED IN"
5930 PRINT"THE FOLLOWING ARE SINGLE KEY COMMANDS. JUST PRESS"
5940 PRINT" A TO DISABLE OR ENABLE AUTOMATIC MODE"
5950 PRINT" C TO COMPUTE IRR(%)"
5960 PRINT" D TO DUPLICATE INCOME FROM * TO YR 5"
5970 PRINT" E TO END PROGRAM AND CLEAR SCREEN"
5980 PRINT" H TO RECALL INSTRUCTIONS - PRESS SPACE BAR T
O CONTINUE"
5990 PRINT" P TO PRINT WORKSHEET OR THIS LIST"
6000 PRINT" R TO RESET ALL VALUES TO 0 OR DEFAULT AMOUNT
S"
6010 PRINT" T TO REVISE TITLE"
6020 PRINT" UP/DN ARROW TO MOVE * UP AND DOWN"
6030 '
6040 FOR J = 1 TO 100
6050 M$ = INKEYS
6060 IF MS <> "*" GOTO 6160
6070 NEXT J
6080 K3 = K3 * -1
6090 IF K3 < 0 GOTO 6130
6100 PRINT@ 676, CHR$(219);
6110 GOTO 6040
6120 '
6130 PRINT@ 676, "PRESS SPACE BAR TO CONTINUE";
6140 GOTO 6040
6150 '
6160 IF MS <> "P" GOTO 6210
6170 IF PEEK(14312) >= 128 GOTO 6240

```

line. You may then key in any string of alphanumerics of up to 35 characters. Use the left arrow to backspace. When the string is complete press enter. PAT automatically centers the title and returns the marker to the line it addressed when you pushed T. When you are changing the title PAT recognizes only enter and clear.

Press the up or down arrows to move the marker up and down the worksheet. Pressing the up arrow when the marker is at line 1 moves the marker to line 14 in the manual mode and line 13 in the automatic mode. Similarly, pressing the down arrow when the marker is at line 13 repositions it at line 1 in the automatic mode and from line 14 to line 1 in the manual mode.

Error Messages

There are only two error conditions. Both involve the number of digits in a value and neither is serious. TOO BIG! appears when you attempt to key in more than the limit of six significant digits. The next keystroke clears the message.

The percent sign indicates that the result of a calculation exceeds the six significant-digit limit. The answer is correct but it will be preceded by % and the decimal points will not line up. In this case you may wish to divide all values by 10 or 100. As long as all amounts have the same relative magnitude the IRR percent does not change.

Sample Problems

We plan to buy office furniture for \$1,125, incur miscellaneous expenses of \$75, add soundproofing to the ceiling of our office at a cost of \$750, and install a personal computer valued at \$2,300 and a printer priced at \$1,500. We also plan to develop software for this machine that will speed order processing. The cost of this development effort is \$3,500. We expect to generate \$7,500 in additional net income the first year, \$8,000 the next, and \$9,500 in years 3-5. How does this proposal compare with another having an IRR percent of 27.8?

First, be sure that PAT is in the automatic mode; Auto should appear in the upper right corner of the screen. If MANL is there press A to change to Auto and use the up or down arrows to position the marker at line 1.

Next, identify all non-depreciable expenses. There is only one, the new ceiling. Key in 750 and press enter. Since the office furniture, computer and printer are depreciable capital, PAT

treats them the same. So we add them and enter 4925. Alternatively you could put PAT into manual, use the plus (+) command, then return to automatic.

The third and fourth items on the worksheet are expenses. We have development and miscellaneous costs. PAT treats them the same so we could enter their sum. However, they are so obviously different that we will keep them separate. Therefore, we enter 3,500 and then 75. The marker is now on line 5, but we have nothing to type here or on line 6 so we skip them by pressing enter once to advance from line 5 to line 6 and again to move to line 7. Now we enter the net incomes as 7500, 8000, 9500, 9500, and 9500. There is no change in line 12, so again press enter. This brings us to line 13. Once more there is nothing to alter so hit enter.

When you press enter at line 13, the marker disappears, <CALC> replaces the mode in the upper right corner of the screen, and numbers flash in line 14. After about 10 seconds 58.1 remains in line 14, the marker returns to line 1, and Auto reappears. The completed worksheet appears in Fig. 2. This project's IRR is much larger than the other project's 27.8, so we'll take this one.

What if development costs go up 15 percent or sales drop by half? Is this project still sound? Try these alternatives and see. You don't have to enter all new information. Simply change the lines that apply. The manual mode may be helpful here and you might want to title each successive "what if." ■

Contact David Plyer at 733 Crescent Parkway, Westfield, NJ 07090.

Project Assessment	
* 1 Non-depreciable capital	:
2 Depreciable capital	:
3 Expense (A)	:
4 Expense (B)	:
5 Product inventory	:
6 Net salvage	:
7 First year net income	:
8 Second year net income	:
9 Third year net income	:
10 Fourth year net income	:
11 Fifth year net income	:
12 Income tax rate (%)	: 43.00
13 Investment credit (%)	: 10.00
14 IRR (%)	:

Figure 2. Sample completed worksheet.

Listing continued

```

6180 K4 = 1
6190 GOTO 6310
6200 '
6210 IF MS = "E" GOTO 7000
6220 IF MS = "H" GOTO 6040
6230 '
6240 CLS
6250 I1 = I
6260 GOTO 1450
6270 '
6280 '
6290 '
6300 ' LINE PRINT ROUTINE CAN BE CALLED FROM HELP LIST OR WORKSHEET
6310 PRINT@ (64 * I + 7), " ";
6320 FOR X=15360 TO 16320 STEP 64 : 'CHECK ALL VIDEO MEMORY ADDRESSES
6330 FOR Z = 0 TO 63
6340 Z1 = PEEK(X + Z) : 'EXAMINE CONTENTS OF VIDEO MEMORY
6350 IF Z1 < 32 THEN Z1 = Z1 + 64 : 'ADDS MSB 4TH BIT
6360 IF Z1 = 60 AND X < 15424 GOTO 6390: 'AVOID PRINTING <PRNT>
6370 LPRINT CHR$(Z1);: ' PRINT CONTENTS
6380 NEXT Z : 'MOVE TO NEXT MEMORY LOCATION
6390 LPRINT : 'MOVE PAPER UP ONE LINE
6400 NEXT X : 'MOVE TO NEXT LINE OF V
IDEO MEMORY
6410 IF K4 = 0 GOTO 6450
6420 K4 = 0
6430 GOTO 6040
6440 '
6450 I1 = I
6460 '
6470 IF A > 0 GOTO 6510
6480 PRINT@ 58, "<AUTO>";
6490 GOTO 1810
6500 '
6510 PRINT@ 58, "<MANL>";
6520 GOTO 1810
6530 '
6540 '
6550 '
6560 ' TITLE ENTRY AND CENTER ROUTINE
6570 PRINT@ 7, "*";
6580 PRINT@ 9, CHR$(95);
6590 PRINT CHR$(240);
6600 TTL$ = ""
6610 MS = INKEYS
6620 IF MS <> "" GOTO 6660
6630 GOSUB 2000
6640 GOTO 6610
6650 '
6660 IF MS = CHR$(9) GOTO 6610
6670 IF MS = CHR$(10) GOTO 6610
6680 FOR X = 24 TO 27
6690 IF MS = CHR$(X) GOTO 6610
6700 NEXT X
6710 IF MS <> CHR$(8) GOTO 6790
6720 IF LEN(TTL$) - 1 = -1 GOTO 6610
6730 TTL$ = LEFT$(TTL$, (LEN(TTL$) - 1))
6740 PRINT@ (LEN(TTL$) + 1) + 8, " ";
6750 PRINT@ (LEN(TTL$) + 1) + 8, CHR$(95);
6760 K = K - 1
6770 GOTO 6610
6780 '
6790 IF MS = CHR$(31) GOTO 6580
6800 IF MS = CHR$(13) GOTO 6920
6810 IF LEN(TTL$) = 35 GOTO 6610
6820 IF MS<> " " GOTO 6860
6830 IF K = 0 GOTO 6610
6840 GOTO 6860
6850 '
6860 TTL$ = TTL$ + MS
6070 PRINT@ LEN(TTL$) + 8, MS;
6080 PRINT CHR$(95);
6890 K = K + 1
6900 GOTO 6610
6910 '
6920 PRINT@ 6, CHR$(244);
6930 K = 1
6940 L = (INT((35 - LEN(TTL$))/2)) + 9
6950 PRINT@ L, TTL$;
6960 GOTO 1760
6970 '
6980 '
6990 '
7000 CLS
7010 ENO

```

Aerocomp's Proven Best-By Test! The

"DDC"

Double Density Controller

★ Technical Superiority

At last! A double density controller for Model I with HIGHER PROBABILITY OF DATA RECOVERY THAN WITH ANY OTHER DOUBLE DENSITY CDNTRDLLER ON THE MARKET TODAY! The "DDC" from Aerocomp. No need to worry about the problems that keep cropping up on existing products. AERDCOMP'S new analog design phase lock loop data separator has a wider capture window than the digital types currently on the market. This allows high resolution data centering. The finest resolution available with digital circuitry is 125 ns (nano seconds). The "DDC" analog circuit allows infinitely variable tuning. Attack and settling times are optimum for 5-1/4 inch diskettes. The units presently on the market use a write precompensation circuit that is very "sloppy". Board to board tolerance is extremely wide - in the order of ± 100 ns. The "DDC" is accurate to within ± 20 ns. The bottomline is state of the art reliability!

★ Test Proven

Tests were conducted on AERDCDMP'S "DDC", Percom's "Doubler A"** and "Doubler II"** and LNW's "LNDoubler"*** using a Radio Shack TRS80*** Model I, Level 2, 48 K with TRS80 Expansion Interface and a Percom TFD100* disk drive (Siemens Model 82). Diskette was Memorex 3401. The test diskette chosen was a well used piece of media to determine performance under adverse conditions. The various double density adapters were installed sequentially in the expansion interface.

The test consisted of formatting 40 tracks on the diskette and writing a 6DB6 data pattern on all tracks. The 6DB6 pattern was chosen because it is recommended as a "worst case" test by manufacturers of drives and diskettes. An attempt was then made to read each sector on the disk once - no retries. Operating system was Newdos/80, Version 1.0, with Double Zap, Version 2.0. Unreadable sectors were totalled and recorded. The test was run ten times with each double density controller and the data averaged. Test results are shown in the table.

★ Features

TRS80 Model I owners who are ready for reliable double density operation will get (1) 80% more storage per diskette, (2) single and double density data separation with far fewer disk I/D errors, (3) single density compatibility and (4) simple plug-in installation. Compatible with all existing double density software.

★ Value \$119.95

for the Best DD Controller on the market.

SPRING SPECIAL
"DDC" and LDOS

\$169.95

\$149.95 for "DDC" with DOSPLUS 3.3D (limited quantity)

Data Separators

The advances that make the "DDC" great are incorporated in the new AERDCDMP Single Density Data Separator ("SDS") and Double Density Data Separator ("DDS").

★ Has your original manufacturer left you holding the bag?

If you already own a Percom "Doubler A", "Doubler II" or LNW "LNDoubler" or Superbrain, the AEROCOMP "DDS" will make it right. Look at the test results:

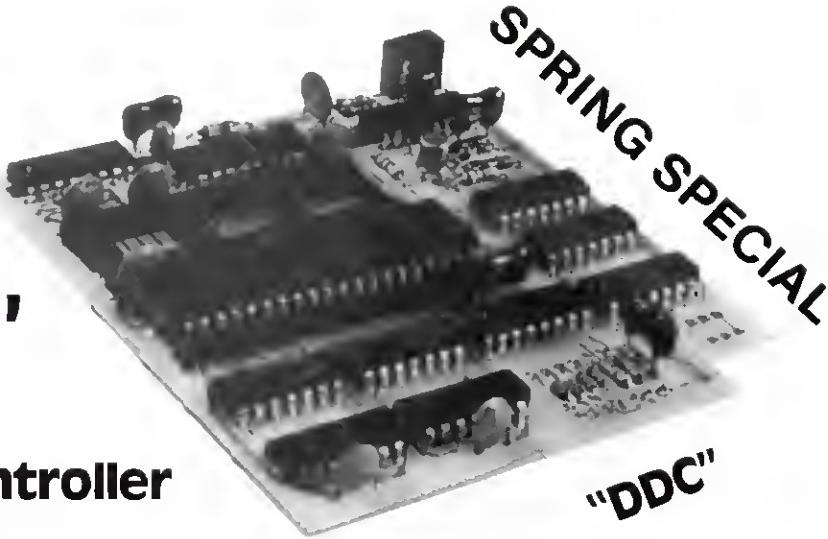
MFR. & PRODUCT	SECTORS LOCKED OUT	
	WITHOUT "DDS"	WITH "DDS"
PERCOM "DOUBLER II"	18	1
PERCOM "DOUBLER A"	250	0
LNW "LNDOUBLER"	202	0

Note: Same test procedures as "DDC".

* Trademark of Percom Data Co.

** Trademark of LNW

*** Trademark of Tandy Corporation



★ TEST RESULTS ★

MFR & PRODUCT	SECTORS LOCKED OUT (AVG)
AEROCOMP "DDC"	0
PERCOM "DOUBLER II"	18
PERCOM "DOUBLER A"	250
LNW "LNDOUBLER"	202

Note: test results available upon written request. All tests conducted prior to 8-25-81

Aerocomp's 14 day money back guarantee applies to hardware only. Specials will be prorated. Shipping \$2.00 in Cont. US. See opposite page for details

★ "DDS" \$49.95
(use 1791 chip from your DD controller)

★ "DDS" with disk controller chip included \$79.95

★ Disk controller chip \$34.95

(Shipping \$2.00 Cont. US - see opposite page for details)

Do you need a Single Density Data Separator?

The internal data separator in the WD1771 chip (R/S Expansion Interface) is NOT recommended by WD for reliable data transfer. Do you have any of these problems: Lost data, tracks locked out, CRC errors, disk retry? YOU NEED ONE!

★ "SDS" \$29.95
(For Mod. I; shipping \$2.00)

Plugs directly into your existing Double Density Controller.

See opposite page ►►►►►

DISK DRIVES

40 & 80 TRACK

SINGLE & DOUBLE SIDED

as low as **\$169**

COMPLETE DRIVES

TRS80 Mod. I & III, 18M PC & TI 99/4A. Power supply & enclosure. Specify silver or almond. MPI or Tandon. 5.25 in.

- ★ 40 track single side.....\$199
- ★ 40 track SS "Flippy".....\$239
- ★ 40 track Dual Head.....\$279
- ★ 80 track SS.....\$299
- ★ 80 track SS "Flippy".....\$329
- ★ 80 track Dual Head.....\$379
- ★ APPLE compatible w/cable (Shugart).....\$279
- ★ APPLE compatible disk controller.....\$89

Shipping & Handling \$5.00 Per Drive

BARE DRIVES

Internal drives for TRS80 Mod. III, 18M PC, TI 99/4A, 5.25 in. (controller required)

- ★ 40 track Single Side.....\$169
- ★ 40 track Dual Head.....\$249
- ★ 80 track SS.....\$269
- ★ 80 track Dual Head.....\$339
(add \$30 for "Flippy" modification)
- ★ 8 inch Single Side Thinline.....\$399
- ★ 8 inch Dual Head Thinline.....\$499

Shipping & Handling \$4.00 Per Drive

MODEL III DRIVES

Convert your cassette Mod. III to disk. Complete internal drive kits with 40 track SS drives, disk controller, power supply, mounting towers, hardware & cables.

- ★ Drive Kit Only (no drives).....\$199
- ★ One Drive System Kit.....\$369
- ★ Two Drive System Kit.....\$539

Shipping & Handling \$8.00 Per System

MODEL I STARTER PACKAGE

One 40 track SS drive, 2-drive cable, TRSDOS 2.3 disk & manual, freight & insurance.

\$249

MISCELLANEOUS GOODIES

- ★ TRSDOS 2.3 disk & manual.....\$20
- ★ LDOS (Mod. I or III).....\$119
- ★ NEWDDS/80, 2.0 (Mod. I or III).....\$129
- ★ DOSPLUS 3.5.....\$129
- ★ Diskettes (10 in library box).....\$23
- ★ MX80 ribbons.....\$9
- ★ 5.25" Drive Power Supply & case.....\$59
- ★ 2-Drive Cable.....\$24
- ★ 4-Drive Cable.....\$34
- ★ Extender Cable.....\$13

Shipping & Handling \$2.00

TRS80 Color Computer Drives

First Drive	\$399
Includes controller, cable (2-D) and Book	
Additional Drives.....	\$199

FREE TRIAL OFFER

Use your AEROCOMP drive for up to 14 days. If you are not satisfied for ANY REASON (except misuse or improper handling), return in the original shipping container for a full purchase price refund. Applies to hardware only. Sorry, we cannot refund on software. We have confidence in our products and we know you will be satisfied.

WARRANTY

We offer a six months warranty on parts and labor against defects in materials and workmanship. In the event service becomes necessary for any reason, our service department is fast, friendly and cooperative. Our goal is 48 hour turnaround on all warranty or repair drives!

100% TESTED

AEROCOMP disk drives are 100% subjected to burn-in and bench test. We even enclose a copy of the test check list, signed by the test technician, with each drive. AEROCOMP means reliability!

ORDER NOW!

Order by mail or call TOLL FREE TO THE NUMBERS BELOW. Please note toll free lines will accept orders only. We accept VISA or MASTERCARD. Be sure to include card number and expiration date. We will not charge your card until the day we ship. Order by mail with credit card or send check or money order. Please allow 2 weeks for personal checks to clear our bank. Order COD. No deposit required but all COD's will arrive cash, certified check or money order only. We'll send a card showing the exact COD amount before your shipment arrives. Shipping is not included in the prices shown. Texas residents add 5% sales tax. NEXT DAY SHIPMENT on all in stock items.

CALL TOLL FREE FOR FAST SERVICE **(800) 824-7888, OPERATOR 24**

FOR VISA/MASTERCHARGE/C.O.D. ORDERS

California dial (800) 852-7777, Operator 24. Alaska and Hawaii dial (800) 824-7919, Operator 24.

TOLL FREE LINES WILL ACCEPT ORDERS ONLY!

For Applications and Technical information, call (214) 337-4346 or drop us a card.

Dealer inquiries invited

AEROCOMP
Redbird Airport, Bldg. 8
P.O. Box 24829
Dallas, TX 75224

v 82



PACESETTERS

Aerocomp leads the way to the BEST value in disk drives on the market. Quality, performance, reliability, warranty, service plus free trial – that's what you get from the leader.

AEROCOMP!

BEST FEATURES

- ★ Fast 5 ms. track-track access
- ★ Single or double density
- ★ Easy entry door
- ★ "Flippy" feature allows read-write to the back of the diskette to cut media cost in half!
- ★ Disk ejector (MPI)
- ★ External drive cable connection (no need to remove the cover to hook up the cable)

NEW!



HALF-HIGH DRIVES

Two complete drives in the space of one. Complete with power supply & enclosure.

- ★ Two 40 track SS.....\$389
- ★ Two 40 track Dual Head.....\$539
- ★ Two 80 track SS.....\$419
- ★ Two 80 track Dual Head.....\$579

Financial Transactions Recorder

by Jim Barbarello

Here's a Model II/16 data base with a difference—it organizes financial transactions into categories and prints tally sheets for each or all.

Program Listing

```

1 REM**          Financial Transactions Recorder
2 REM**          NAME: FTR
3 REM**          LATEST UPDATE: #9, 30 DEC 1982 (Auto Check Numbers)
4 REM**          c 1982 by J.J. Barbarello
5 REM**
10 CLEAR 5000:DEFSTR A,B,D:DIM A(100),GT#(1),T#(1):DR=CHR$(26):DN=CHR$(25):DLN=S
TRINGS(79,150)
20 CLS:PRINT#(10,35),DR;" WAIT... ";DN;:RD$=MIDS(DATES$,7,2)+" "+MIDS(DATES$,4,3)+"
"+MIDS(DATES$,5,4)
21 P(1)=9:P(2)=11:P(3)=13:P(4)=15:P(5)=17:P(6)=19:DF="##"+CHR$(175)+"##"+CHR$(17
5)+"##"
30 ON ERROR GOTO 15000:DEFUSR0=&HF000:SYSTEM"LOAD PRMS"
40 ADAT="312831303130313031":BC(1)="START":BC(2)="FINISH"
50 OPEN"D",1,"BUSINESS/DAT",64:GOSUB 11510
60 OPEN"D",2,"CATEGORY/DAT",30:FIELD 2,3 AS ACAT:IF LOF(2)<>100 THEN LSET ACAT=
":FOR I=1 TO 100:PUT 2,I:A(I)="":NEXT:GOTO 500
70 FOR I=1 TO 100:GET 2,I:A(I)=ACAT:NEXT
500 CLS:PRINT#(3,9),CHR$(2),"F I N A N C I A L   T R A N S A C T I O N S   R E C
O R D E R":PRINTDLN:PRINT#(22,27),"c 1982 By J.J. Barbarello";
510 PRINT#(6,20),"TASKS:";
520 PRINTTAB(38):DR;" 1 ";DN;" ADD Data":PRINT
530 PRINTTAB(38):DR;" 2 ";DN;" MODIFY Data":PRINT
540 PRINTTAB(38):DR;" 3 ";DN;" PRINT Tally Sheet":PRINT
550 PRINTTAB(38):DR;" 4 ";DN;" DEFINE Categories":PRINT
560 PRINTTAB(38):DR;" 5 ";DN;" PRINT Category Definitions":PRINT
570 PRINTTAB(38):DR;" 6 ";DN;" END"
580 PRINT#(19,25),"Press ";DR;" NUMBER ";DN;" of TASK desired...";CHR$(1);
590 A=INPUT$(1):IF VAL(A)<1 OR VAL(A)>6 THEN 590
600 ON VAL(A) GOSUB 11000,2000,3000,4000,5000,6000:GOTO 500
1000 CLS:PRINTTAB(25);T A S K   # 1: M O D I F Y   D A T A":PRINTDLN
1010 GOSUB 11000:IF A="R" THEN RETURN
1020 RN=LOF(1)+1:SRL1=GOSUB 11510:GOSUB 12750
1021 X=1:GOSUB 12000
1100 GOSUB 11020:IF A="R" THEN RETURN ELSE 1020
2000 CLS:PRINTTAB(20);T A S K   # 2 : M O D I F Y   D A T A":PRINT DLN
2010 GOSUB 11000:IF A="R" THEN RETURN
2020 PRINT#(2,0),CHR$(24),:PRINT#(3,0),"Enter ";DR;" FILE NUMBER ";DN;" of Trans
action to be Changed: ";
2030 LINE INPUT FILES:RN=VAL(FILES$):IF RN<1 OR RN>LOF(1) THEN PRINT#(5,25),"** I
NVALID ENTRY **":GOSUB 11020:IF A="R" THEN RETURN ELSE 2020
2040 GOSUB 11510:GET 1,RN:SR=2:GOSUB 12750:X=1
2050 PRINT#(9,30),ANAM
2060 PRINT#(11,30),:PRINTUSING"##/##/##":ASC(MOS):ASC(DAY):ASC(YEARS)
2070 PRINT#(13,29),:PRINTUSING"#####.##":CVD(AMT)
2080 PRINT#(15,30),STR$(ASC(CATS));" - ";A(ASC(CATS))
2090 PRINT#(17,30),CHKS
2100 PRINT#(19,30),STATUS$ 
2110 PRINT#(9,30),:GOSUB 12000
2120 GOSUB 11020:IF A="R" THEN RETURN ELSE 2020
3000 CLS:PRINTTAB(15);T A S K   # 3: P R I N T   T A L L Y   S H E E T":PRINT
DLN
3010 GOSUB 11000:IF A="R" THEN RETURN ELSE ERASE GT#,T#:DIM GT$(99),T$(99):GT#=0
:T#=0
3020 PRINT#(3,0),CHR$(24):PRINT#(10,0),"Press ";DR;" P1 ";DN;" for Hard Copy, or
";DR;" F2 ";DN;" key for video...";
3030 A=INPUT$(1):IF ASC(A)<>1 AND ASC(A)<>2 THEN 303ELSE FL=66:PC=80:SW=ASC(A):
GOSUB 11230:IF SW=1 THEN PRINT#(10,25),"Bring Paper to Top of Page."
3040 GOSUB 11020:IF A="R" THEN RETURN ELSE T#=0:GT#=0:CG=0
3050 PRINT#(3,0),CHR$(24);:Print ";DR;" F ";DN;"ull Tally Sheet or a ";DR;" P ";
DN;"option...";
3060 A=INPUT$(1):GOSUB 11400:IF A<>"F" AND A<>"P" THEN 306ELSE PRINT A
3070 IF A="F" THEN FR=1:LR=LOF(1):CG=0:CG(1)=1:CG(2)=99:GOTO 3150
3080 PRINT#(6,0),"Start File Number...";CHR$(23);:LINE INPUT A:IF VAL(A)<1 OR VA
L(A)>LOF(1) THEN 308ELSE FR=VAL(A)

```

Listing continued

Your finances probably involve more than a simple checking account. You may have a small business with revenue in checks and cash, you may receive payment for professional services, or you may want to track office or other miscellaneous expenses. A detailed record of these transactions, broken down into your own predefined categories, would be a bookkeeping boon, especially at tax time.

FTR (Financial Transactions Recorder) is an automated transaction system for the Model II/16 TRSDOS 2.0 operating system that lets you post financial transactions to one of 99 different user-defined categories. You can obtain a tally sheet for any single category or a contiguous range of categories. In addition, you can opt to see all transactions posted, or only a limited range of transactions (such as only those made since your last tally sheet was printed). In both cases, the tally sheet provides you with a report total (a total of all the transactions in the report) and a grand total (a total of all the transactions on file for each category).

How FTR Works

In the following example of FTR, assume you are a self-employed professional with a secretary, a small office, and the standard expenses (office supplies, insurance, and professional fees, for example). You might also have additional outside expenses and in-

The Key Box

Model II/16
64K RAM
Basic
Printer (optional)

PUT PRICES IN CHECK

RADIO SHACK®

ZIP-BOX RELOADS FOR

LINE PRINTER

I, II, & IV

\$2.77 EA. \$29.92 DOZ.

INNOVATIVE CONCEPTS
FLIP'N'FILE

DISC STORAGE BOX
HOLDS UP TO 60 DISKETTES

5½" 8"

\$24.95 EA. \$29.95 EA

CARTRIDGE RIBBONS FOR
APPLE PRINTERS
NEC 8023A
C. ITOH PROWRITER

\$9.95 EA. \$107.46

CARTRIDGE RIBBONS FOR

EPSON

MX-80 MX-100

\$6.99 EA. \$11.95 EA.
\$75.49 DOZ. \$129.06 DOZ.

NEW ITEM
CARTRIDGE RIBBONS FOR
RADIO SHACK®

LINE PRINTER

VI & VIII

\$7.99 EA. \$86.29 DOZ.

CARTRIDGE RIBBONS FOR
RADIO SHACK®
DAISY WHEEL
& DAISY WHEEL II
MULTI-STRIKE NYLON

\$5.99 EA. \$64.69

MEMOREX
DISKETTES

5½ SINGLE-SIDE DUAL DENSITY
#3481

\$24.99
10 PACK

RIBBONS FOR
IDS PRINTERS

440	\$2.75	\$29.70
PAPER TIGER	6.95	75.06
MICROPRISM	7.99	86.29
PRISM	10.95	118.25

CARTRIDGE RIBBONS FOR
RADIO SHACK®

LINE PRINTER

III & V

NEWLY DESIGNED CARTRIDGE

\$6.49 EA. \$70.09

PROTECTALL
LINE VOLTAGE
SURGE
SUPPRESSOR
(SIX OUTLET)

\$39.95 EA

MAXELL
DISKETTES

5½" SINGLE SIDE
DUAL DENSITY
MD-1

\$29.90 EA

LABEL
SPECIAL

\$2.99 / K
(5K MIN)

1 ACROSS 3½" x 15/16 CONTINUOUS LABELS

MOST RIBBONS AVAILABLE IN COLORS TOO!

CALL OR WRITE FOR OUR SUPPLIES CATALOGUE
ON ORDERS UNDER \$14.00 PLEASE ADD \$3.00 FOR SHIPPING
MINIMUM RIBBON ORDER \$30.00 OR 1 DOZEN



TOLL FREE 800-343-7706

IN MASS 617-963-7694

PHONES OPEN 9AM-6PM EASTERN TIME

Check-Mate™

51 DIAUTO DR. P.O. BOX 103
RANDOLPH, MA 02368

*RADIO SHACK IS A REGISTERED TRADEMARK OF THE TANQY CORP.

MASS RESIDENTS
ADD 5% SALES TAX

FINANCIAL TRANSACTIONS RECORDER

TASKS:

- 1 ADD Data
- 2 MODIFY Data
- 3 PRINT Tally Sheet
- 4 DEFINE Categories
- 5 PRINT Category Definitions
- 6 END

Press **NUMBER** of TASK desired...

© 1982 By J.J. Barbarello

Figure 1. FTR's main menu (screen 1).

TASK #4: DEFINE CATEGORIES

CATEGORIES:

1.	11.
2.	12.
3.	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

Enter Category Number to be changed (or press **ENTER**)...

(*Category# 100 is Last Numeric Check Number)

Figure 3. The working screen for category definition (screen 3).

TASK #4: DEFINE CATEGORIES

_____ → **C**ontinue or **R**eturn... ← _____

Figure 2. Task identification screen (screen 2). In this case, the task chosen from the main menu was option 4, Define Categories.

TASK #4: DEFINE CATEGORIES

CATEGORY # 1 :
Change to (press **ENTER** if no change): PROFESSIONAL INCOME
CATEGORY # 1 : PROFESSIONAL INCOME

Save New Category Definition (Y/N)?...Y

NEW CATEGORY # 1 DEFINITION SAVED...

_____ → **C**ontinue or **R**eturn... ← _____

Figure 4. A category chosen from screen 3 appears on this screen (screen 4), along with any previous definitions for that category.

come, such as those from lecturing or freelance writing.

You can keep track of your financial status and document income tax returns using FTR's tally sheet printouts.

You might divide your transactions into these categories:

1. Professional income
2. Employee wages

3. Office expenses
4. Insurance
5. Related professional expenses
11. Lecture fees
12. Lecture expenses
16. Author fees
17. Author expenses

The three major areas of income listed above form three contiguous groups.

Note that the numbers 1, 11, and 16 start each related financial category. Should your activities increase, you can add categories later on.

Program Overview

FTR is menu-driven. The first screen (main menu) asks whether you want to add or modify data, print a tally sheet, define your categories, print category

ARE YOU TIRED OF HEADACHES AND WATERY EYES FROM STARING AT YOUR TRS-80'S HARSH WHITE VIDEO DISPLAY?

Well, a **FATIGUE FIGHTER** optical filter changes that display to a nice, easy on the eyes, green. It is made of hard 1/8 inch thick acrylic for durability, attaches in seconds without tools, and matches TRS-80® styling. So, invest in some relief, get a **FATIGUE FIGHTER** for your Model I, II, or III. It will probably be one of the most used accessories you will ever buy.

P.S. Available direct from us or at computer stores.

TRS 80 IS A TANDY CORP TRADEMARK

TO ORDER:
Send Name & Address Typed or Clearly Printed with Check or Money Order (U.S. FUNDS) for \$14.95 Each, Including Shipping Canadian Orders Add \$1.00 Each. All Other Foreign Orders Add \$3.00 Each for Shipping. NO CREDIT CARD ORDERS. COD's (U.S. ORDERS ONLY) are \$3.00 Additional per Order & are Accepted by Mail or by Calling 904 378 2494 or 9-5 M-F. Florida Residents Add 5% Sales Tax



**SOUTHERN INNOVATIVE DESIGN
3033-15 N. E. 19TH DRIVE
GAINESVILLE, FL 32601-3326 ✓35**

— DEALER INQUIRIES INVITED —

Tired of WAITING on your printer or is your printer too SLOW . . . ? CALL 1-800-231-6667



MBIP STAND-ALONE PARALLEL PRINTER BUFFER

32K Parallel.....	\$299.95
64K Parallel.....	\$349.95
64K Upgrades.....	\$179.95

How It Works

The MBIP in-line parallel buffer works with almost any computer/printer combination utilizing a Centronics type parallel interface. Available with up to 256K of RAM for data buffering, the MBIP can accept very large files for buffering as fast as your computer can send it.

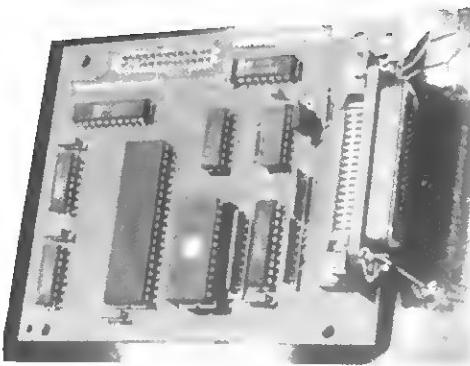
Saves Time

Most computers are able to send data to the printer at very high speeds, usually much faster than the printer can print it. The MBIP, placed between the computer and the printer, accepts this data as fast as the computer can send it, stores it in its own memory and then sends it on to the printer at the printer's own speed. Under normal circumstances without a MBIP the computer could be tied up for hours on a large file being dumped into the printer costing you valuable time and money.

Improves Efficiency

Using the MBIP's touch sensitive front panel controls, multiple copies of your document can be made without tying up the computer any further. Printing may be halted at any point and continued where it left off later. You can even turn your computer off and the MBIP will continue until the print job is complete.

The MBIP requires no user modifications of software and installs in seconds with virtually any computer (including TRS-80, ATARI, IBM-PC, APPLE, OSBORNE, NEC etc.) and any printer (including EPSON, CENTRONICS, NEC, C.I.T.O.H., IDS, ANADEX, OKIDATA, IBM PERSONAL etc.), dimensions are 5 $\frac{1}{8}$ "W x 7 $\frac{3}{4}$ "D x 1 $\frac{1}{8}$ "H.



INTERNAL PARALLEL BUFFER FOR EPSON

MBP	MBP	MBP
16K	32K	64K
\$159.95	\$199.95	\$249.95

Operation

The MBP is an intelligent Centronic-Compatible parallel interface for the Epson MX-80, MX-80 F/T, and MX-100 printers, with 16K, 32K, 64K bytes of on-board RAM for data buffering. FX80 and FX100 compatible.

Eliminates Printer Bottleneck

The buffering capability of the MBP increases your data processing efficiency by eliminating the wait normally experienced while printing. An Epson printer prints at 80 characters per second; at this speed it takes about five minutes to print a 16,000 character document. During most of this time the computer is waiting for Epson to finish one line so it can send the next. By using the MBP it takes the computer only four seconds to send a 16,000 character document. The Practical Peripherals MBP interface typically accepts data as fast as the computer can send it, until full, returning use of the computer to you while it handles the printing. You can continue with other processing while simultaneously printing data from a previous job, gaining all the time you normally would have spent waiting for the printer to finish. Any program that involves printed output will be speeded up using the MBP.

The MBP supports all standard Epson Commands, is compatible with GRAFTRAX-80, and is plug compatible with the standard Epson cable. THE MBP does not require any user software for control.

Installs In Minutes

The MBP is easy to install — it simply plugs into the existing auxilliary interface connector inside the Epson without modification of the printer.

MICRO SOLUTIONS, INC.

9949 HARWIN #E, HOUSTON, TEXAS 77036

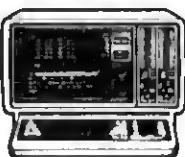
(713) 789-5443 1-800-231-6667

TELEX 794-250-CROWNTX HOU

VISA • MASTER CARD • AMERICAN EXPRESS

v316

RadioShack TRS-80's Full Line



YOU CAN SAVE money when you buy Radio Shack TRS-80 Computers from **Pan American Electronics**. Pan American Electronics went into business in 1976 and led the way in bringing consumers original Radio Shack TRS-80 Computers at reduced prices. **NO** other company has done it longer. **NO** other company has done it better and **NO** other company sells them for less.

Pan American Electronics

TOLL FREE NUMBER 800/531-7466

1117 Conway Avenue • Department E.M.
Mission, Texas 78572
Phone: 512/581-2766
Telex Number 767339

TM — Trademark of Tandy Corporation

✓122

**New Inmac Catalog
jam-packed
with computer/
wp supplies.**

Yours free!

Accurately called "the bible of the industry," it's loaded with great products and ideas for your personal computer, minicomputer or word-processing system. You'll enjoy

- **One-stop shopping.** Over 2,000 products to choose from.
- **Easy ordering.** Mail, phone, or TWX. Verbal P.O.'s welcome.

*For fastest delivery of your free 100-page Inmac catalog,
call 1(800) 547-5444. 1(800) 547-5447 in California.*

inmac Catalog Dept., 2465 Augustine Drive, Santa Clara, CA 95051
Please be sure to include your phone number. ✓51

NAME _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____

287102

CONVERT YOUR TRS-80 MODEL I, III, OR 4 INTO A DEVELOPMENT SYSTEM



Complete instructions and sample schematics are included to help you design your own simple stand-alone microcomputer systems. THESE SYSTEMS CAN BE AS SIMPLE AS FOUR ICs: one TTL circuit for clock and reset, a Z-80, an EPROM, and one peripheral interface chip.

When the In-Circuit-Emulation cable is plugged into the Z-80 socket of your stand-alone system, the system becomes a part of your TRS-80. You can use the full power of your editor/assembler's debug and trace program to check out both the hardware and the software. Simple test loops can be used to check out the hardware, then the system program can be run to debug the logic of your stand-alone device.

Since the program is kept in TRS-80 RAM, changes can be made quickly and easily. When your stand-alone device works as desired, you use the Developmate's PROM PROGRAMMER to copy the program into a PROM. With this PROM, and a Z-80 in place of the emulation cable, your stand-alone device will work by itself.

The DEVELOPMATE is extremely compact: Both the PROM programmer and the In-Circuit-Emulator are in one small plastic box only 3.2" x 5.4". A line-plug mounted power supply is included. The PROM programmer has a "personality module" which defines the voltages and connections of the PROM so that future devices can be accommodated. However, the system comes with a "universal" personality module which handles 2758, 2508 (8K), 2716, 2516 (16K), 2532 (32K), as well as the new electrically alterable 2816 and 48016 (16K EEPROMs).

The COMPLETE DEVELOPMATE 81, for Model I, with software, power supply, emulation cable, TRS-80 cable, and "universal" personality module \$329

DEVELOPMATE 83, Model III/4 version, same as above \$329

PM2 PERSONALITY MODULE for 2732A EPROM \$15

PM3 PERSONALITY MODULE for 2764 EPROM \$15

**ORION
Instruments**

✓151

172 Otis Avenue, Dept. M, Woodside,
CA 94062

(415) 851-1172

Master Charge and Visa phone orders accepted.
California residents please add 6% sales tax.

TASK #4: DEFINE CATEGORIES

CATEGORIES:

1. PROFESSIONAL INCOME	11. LECTURE FEES
2. EMPLOYEE WAGES	12. LECTURE EXPENSES
3. OFFICE EXPENSES	13.
4. INSURANCE	14.
5. RELATED PROFESSIONAL EXPENSES	15.
6.	16. AUTHOR FEES
7.	17. AUTHOR EXPENSES
8.	18.
9.	19.
10.	20.

Enter Category Number to be changed (or press **ENTER**)...
 ("Category" 100 is Last Numeric Check Number)

Figure 5. Screen 5 (above) lists all the categories defined. If you enter 100 at the cursor, your checks are automatically numbered.

TASK #4: DEFINE CATEGORIES

LAST NUMERIC CHECK NUMBER: 8
NEW LAST CHECK NUMBER : 1234

Save (Y/N)?...Y

NEW LAST CHECK NUMBER ERVED...

Continue, or **R**eturn...

Figure 6. Status of the check-numbering routine (screen 6).

TASK #11 ADD DATA

Use ARROW keys to position cursor. Type in data. Press **F1** key when all done.

FILE NUMBER: **NEW** LAST CHECK #: 1234 (Press **F2** for NEXT Check #)

Parsee :
 Date :/..
 Amount : \$.....
 Category: ..
 Check #:

Figure 7. Enter financial transactions on this screen (screen 7).

TASK #11 ADD DATA

Use ARROW keys to position cursor. Type in data. Press **F1** key when all done.

FILE NUMBER: **NEW** LAST CHECK #: 1234 (Press **F2** for NEXT Check #)

Parsee : Mrs. Jones (Week of 3 Jan 1983)
 Date : 1/7/83
 Amount : \$ 234.56
 Category: 2 - EMPLOYEE WAGES
 Check #: 1235

Save this data, **C**ancel any NEW entries, or **E**nter more data...

Figure 8. Above is an example of screen 7 completed, with options to save data, cancel new entries, or enter more data (screen 8).

Listing continued

```

3470 PRINT#(SW,10),"Report Completed. Press ANY key to return to menu...";CHR$(2
3);
3480 A=INPUTS{1}:RETURN
3490 REM**      TOP OF PAGE TITLING UTILITY
3500 LPRINT TAB(20);"T A L L Y   S H E E T  - ";RD$;TAB(70);"PAGE";PG
3510 LPRINT TAB(20);"-----"
3520 LPRINT TAB(26);:IF CG(2)-CG(1)<>0 THEN LPRINT USING"(CATEGORY: ## TO ##)" ;
  CG(1);CG(2) ELSE LPRINT USING" (CATEGORY: ##)" ;CG(1)
3530 LPRINT FILE#,DESCRIPTION";TAB(46);"DATE";TAB(56);"AMOUNT";TAB(66);"C
  HECK NO.";TAB(76);"CAT"
3540 LPRINT"-----";STRINGS(37,"-");TAB(44);"-----";TAB(53);"-----";TAB(
  65);"-----";TAB(76);"---"
3550 LPRINT:RETURN
3560 RETURN
4000 CLS:PRINTTAB(15);"T A S K   # 4:   D E F I N E   C A T E G O R I E S":PRINTO
LN:NN=1
4010 GOSUB 11000:IF A="R" THEN RETURN
4020 PRINT#(3,0),CHR$(24);"CATEGORIES":;PRINT:CN=0:NCS=""":CNS="""
4030 FOR I=NN TO NN+9:PRINT#(##);I;PRINT". "A(I);TAB(40);:PRINTUSING"##"
  I+10:PRINT". "A(I+10):NEXT
4040 PRINT#(18,18).("":CHR$(34);"Category";CHR$(34);" 100 is Last Numeric Check
  Number");CHR$(23):PRINT#(16,5),nEnter Category Number to be changed (or press ";
  DR;" ENTER ");DN;" ...";
4050 LINE INPUT CNS:IP LEN(CNS)<>0 THEN 4080
4060 GOSUB 11020:IF A="R" THEN RETURN
4070 NN=NN+28:IF NN>99 THEN NN=1:GOTO 4020ELSE 4020
4080 CN=VAL(CNS):IF CN<1 OR CN>100 THEN 4040
4085 IF CN=100 THEN PRINT#(3,0),"LAST NUMERIC CHECK NUMBER: ",VAL(A(100));CHR$(2
  4);:GOTO 4170
4090 PRINT#(3,0),"CATEGORY #";CN": "A(CN);CHR$(24);
4100 PRINT:PRINT"Change to (press ENTER if no change): ";
4110 LINE INPUT A:IF LEN(A)=0 THEN GOSUB 11020:IF A="R" THEN RETURN ELSE 4020
4120 NC$=LEFT$(A,30):PRINT#(5,0),DR;"CATEGORY #";CN": "NC$"; "DN;CHR$(23)
4130 PRINT:PRINT"Save New Category Definition (Y/N)?...";
4140 GOSUB 11200:IF A="N" THEN PRINT#(10,0),DR;" NEW CHANGE CANCELLED... ";DN:GO
  TO 4160
4150 PRINT#(10,0),DR;" NEW CAGEORY #";CN;"DEFINITION SAVED... ";DN:LSET ACAT=NCS
  :PUT 2,CN:A(CN)=NCS
4160 GOSUB 11020:IF A="R" THEN RETURN ELSE 4020
4170 PRINT#(5,0),"Change to (press ENTER if no change): ";

```

Listing continued

replace it with a new one.

If you want to enter a new category, type it in and answer yes to the save prompt. You can enter more categories or return to the main menu.

Once you've finished entering all your categories, screen 5 appears, listing all the categories (see Fig. 5). Enter 100 to initialize FTR's numeric check tracker. This feature lets you define the starting check number and thereafter automatically increments and posts that number.

FTR accepts string input of check numbers to accommodate money orders or items with numbers and letters or you can make short notes, such as denoting a cash payment. The procedure to implement this system appears in Fig. 6.

Entering Transactions

Once you've set up all your categories, you can begin entering data into them. To enter a transaction, select option 1 from the main menu and answer C (to continue) in response to the task

Forum Sixty-Eight



If the same old news and reviews cause you to snooze then choose:

Forum Sixty-Eight

or

Color Computer News

Forum Sixty-Eight is new to date and will prove itself real soon. So rows from your slumber and get the first number. Cause the first issue's coming in June.

Forum Sixty-Eight is the journal for Motorola Microprocessors. The forum covers business, scientific and recreational computing.

Color Computer News will wake your computer and open your eyes up wide. And soon you'll discover from cover to cover there's lots of good info inside.

Color Computer News is the original Color Computer magazine covering the entire spectrum of Color Computing from beginner to advanced.

PC Magazine Software Inc.
P.O. Box 1122
Marlboro, MA 01752
(617) 432-8100

The 12 issue subscription rate is:
United States \$20.00
Canada/Mexico \$26.00
Europe \$48.00
Combination Subscriptions \$38.00
U.S. only

PC Software User
P.O. Box 1122
Edmonton, Alberta T6V 1L1
CANADA
Canadian subscriptions to
Color Computer News only

Name _____	Address _____	
Unit _____	State _____ Zip _____	
Phone Number _____	Expiration Date _____	
<input type="checkbox"/> Color Computer News	<input type="checkbox"/> Forum Sixty-Eight	<input type="checkbox"/> Other
Subscription begins with next available issue		
80M	v145	All issues 10 weeks for delivery



♣ ♣ ♣ OMNITEK COMPUTERS INTERNATIONAL, INC. ♣
♣ 1300 MAIN STREET TEWKSBURY, MASS 01876 ♣

617-851-4580 v195

CBM64	CALL
Verbatim 5.25" D.L.....	25.00
5 1/4" Head Cleaning Kits.....	5.00 each or 3 for \$12.00
Okiidata Microline 80.....	299.00
Okiidata Microline 82A.....	309.00
Okiidata Microline 83A.....	629.00
Okiidata Microline 92 (160 C.P.S.) corresponds mode.....	499.00
Okiidata Microline 93.....	299.00
Gemini 10 Printer.....	309.00
13" Green Monitor.....	99.00
B.M.C. 13" Color Monitor.....	299.00
Epson FX80 FT.....	539.00
Epson MX-100.....	629.00
Radio Shack M/4 w/64K.....	999.00
Radio Shack M/4 w/64K and 2 40 Trk.....	1699.00
..... and R523Z.....	1787.00
40 track economy drive Power Supply with case.....	179.00
Tandon drives with Power Supply and case	
4D track singlehead.....	249.00
dual head.....	339.00
8G track singlehead.....	299.00
dual head.....	399.00
5.25" Power Supply and case.....	39.00
*BASF 40 track D.D. 5 1/4" new disk drive, as is, no return.....	89.00
8" Power Supply and case.....	95.00 or 10 for 85D.00
Call for popular D.W. Printer Prices	
Full Commodore Line.....	CALL

♣ ♣ ♣ OMNITEK COMPUTERS INTERNATIONAL, INC. ♣
♣

TRS-80 is a reg. trademark of Tandy Corp. Prices are for mail order only. TERMS:
Check, money order, Mastercard and Visa accepted. F.O.B. Tewksbury Freight ex-
tra. Minimum \$5.00 S & H. Mass residents add 5% sales tax. Write for FREE
CATALOG



HARDWARE

Model III 48K 2 Disk System	\$1395.00
Model 4 64K 2 Disk + RS-232	1549.00
Model 12 80K 2 Disk System	3295.00
Model 16 128K 2 Disk System	4699.00
Color Computer 64K Ext. Basic	349.00
Model III Kit with 2 Drives	\$599.00
Model 4 Kit with 2 Drives	599.00
5 Meg Hard Disk for any computer	1249.00
10 Meg Hard Disk	1449.00
15 Meg Hard Disk	1599.00
Corvus 5 Meg Disk with Card	1995.00
Corvus 20 Meg Disk with Card	3595.00
Okiidata ML-82A Printer	\$399.00
Okiidata ML-83A	639.00
Okiidata ML-84	969.00
Okiidata ML-92	519.00
Okiidata ML-93	889.00
Gemini 10 Printer	329.00
Gemini 15	459.00

SOFTWARE

VISACALC SPREADSHEET

\$79.95

Complete spreadsheet with full screen cursor control. Make Projections, Reports, Graphs, labels. Searches, Sorts, and Formulations.

SCRIPT WORD PROCESSOR

\$79.95

Full Screen Text Editor. You may add, move, delete, underline, indent, center, justify. Fully machine code for speed & performance.

VERSAFILE DATA BASE

\$79.95

Free formatted data base with extensive edit and search commands. Full printer support. High speed operation and menu supported.

ACCOUNTS RECEIVABLE

\$79.95

Monthly statements, aging reports, journals, automatic totals for posting to Ledger. Easy to add, delete, or modify all 500 accounts.

ACCOUNTS PAYABLE

\$79.95

Prints checks, monitor cash flow, detailed reports, up to 200 vendors. Handles 1000 transactions. User defined parameters.

Hundreds of other features! Call for details. Each program comes with an extensive manual and is available on Disk or Cass. for any Model I, II, III, or 4 computer with 16-64K of memory. All 5 programs may be purchased for only \$299.95!

DEFENDOIDS

A superior arcade style game with fast action graphics and sound! Your mission is to rescue the fuel tanks from the planet's surface. You must do battle with the evil enemy ships. Machine Language. Model I, III, & 4. \$15.95!

SOFTRONICS COMPUTER SYSTEMS

918-749-6211

2300 E. 14th Suite 204
Tulsa, Oklahoma 74104

Include 3% shipping. \$1.00 minimum. OK residents add 5% tax. Call for prices on other products. Prices and availability subject to change. Open 10 a.m. to 6 p.m. BBS available with prices at all other times.

v116

TASK #1: ADD DATA

Use ARROW keys to position cursor. Type in data. Press **F1** key when all done.

FILE NUMBER: **NEW** SAVING DATA... DATA SAVED IN FILE NUMBER **1**

Payee : Mrs. Jones (Week of 3 Jan 1983)
 Date : 1/ 7/83
 Amount : 234.55
 Category: 2 - EMPLOYEE WAGES
 Check #: 1235

_____) **C**ontinue or **R**eturn... _____)

Figure 9. Screen 9 (above) appears when FTR is storing data. Note the assignment.

TASK #2: MODIFY DATA

Enter **FILE NUMBER** of Transaction to be Changed! 2
 ** INVALID ENTRY **

_____) **C**ontinue or **R**eturn... _____)

Figure 10. This screen (screen 10) appears when you try to locate a nonexistent file.

Listing continued

```

4180 LINE INPUT A:IF LEN(A)=0 THEN GOSUB 11020:IF A="R" THEN RETURN ELSE 4020
4190 IF VAL(A)=0 THEN GOSUB 11020:IF A="R" THEN RETURN ELSE 4920
4200 NC$=STHS(VAL(A)):PRINT#(5,0),DR;" NEN LAST CHECK NUMBER ";DN": " ,NC$,CHR$(23)
4210 PRINT#(7,30),"Save (Y/N)...";
4220 GOSUB 11200:IF A="N"THEN PRINT#(10,28),DR;" NEW CHANGE CANCELLED... ";DN:GO TO 4160
4230 PRINT#(10,25),DR;" NEW LAST CHECK NUMBER SAVED... ";DN:LSET ACAT=NC$:PUT 2,1
00:A(100)=NC$:GOTO 4160
5000 CLS:PRINTTAB(5);T A S K # 5: P R I N T C A T E G O R Y D E F I N I
T I O N S":PRINT DLN
5010 GOSUB 11000:IF A="R" THEN RETURN
5020 PRINT#(3,0),CHR$(24):PRINT#(10,10),"Bring Paper up to Top of Page. Press ";
DR;" F1 ";DN; " key when ready... ";
5030 A=INPUT$(1):IF ASC(A)<>1 THEN 5030ELSE PL=66:PC=00:GOSUB 11230
5040 GOSUB 11020:IF A="R" THEN RETURN
5050 PRINT#(3,0),CHR$(24):PRINT#(10,23),DR;" PRINTING CATEGORY DEFINITIONS... ";
DN;
5060 LPRINTTAB(30);CATEGORY DEFINITIONS":LPRINTTAB(30);-----:L
PRINT
5070 FOR I=1 TO 50:LPRINT USING "#";I:;LPRINT". ";A(I):TAB(39);
5080 LPRINT USING "#";I+50:LPRINT". ";A(I+50)
5090 NEXT:SYSTEM" "
5100 PRINT#(10,23),"Printing Completed. Press ANY key to continue... ";
5110 A=INPUT$(1):RETURN
6000 CLS:PRINTTAB(30);T A S K # 6 : E N D":PRINT DLN
6010 GOSUB 11000:IF A="R" THEN RETURN
6020 PRINT#(10,35),DR;" WAIT... ";DN:PRINT#(12,35),:SYSTEM"DUAL OFF":PRINT#(11,
0),CHR$(24)
6030 CLOSE:PRINT#(10,32),DR;" PROGRAM ENDED... ";DN:PRINT:PRINT:END
10000 REM** DATE CONVERSION SUBROUTINE **
10010 IF VAL(DTE)=0 THEN MO=0:DAY#=0:YEAR=0:RETURN
10020 MO=VAL(LEFT$(DTE,2)):YEAR=VAL(RIGHT$(DTE,2)):IF INSTR(DTE,"/">>0 THEN DAY
#=VAL(MIDS$(DTE,INSTR(DTE,"/")+1,2)) ELSE DAY#=VAL(MIDS$(DTE,INSTR(DTE,".")+1,2))
10030 MAX=VAL(MIDS$(ADAT,(MO-1)*2+1,2)):IF INT(YEAR/4)=YEAR/4 AND MO=2 THEN MAX=2
9
10040 IF DAY%>MAX OR YEAR>99 OR YEAR<1 OR MO>12 OR MO<1 THEN MO=99:DAY#=99:YEAR=
99:DTE="99.99.99"
10050 RETURN
11000 REM** CONTINUE/RETURN QUERY SUBROUTINE
11010 PRINT#(2,0),CHR$(24)
11020 PRINT#(22,0),CHR$(23);STRINGS$(21,150);">";:PRINT#(22,60), "<;STRINGS$(10,15
0);:PRINT#(22,20),DR;" C ";DN:continue; " ;DR;" R ";DN;"return... "
11030 A=INPUT$(1):IF ASC(A)>96 THEN A=CHR$(ASC(A)-32)
11040 IF A<>"C" AND A<>"R" THEN 11020ELSE PRINT#(22,0),CHR$(23);:PRINT#(2,0),:;R
ETURN
11100 REM** PRESS ANY KEY UTILITY **
11110 PRINT"Press ANY key to continue... ";
11120 A=INPUT$(1):RETURN
11200 REM** YES/NO ANSWER UTILITY
11210 A=INPUT$(1):NU=ASC(A):IF NU=96 THEN NU=NU-32:A=CHR$(NU)
11220 IF A<>"Y" AND A<>"N" THEN 11210ELSE PRINT A:RETURN
11230 REM** FORMS SET - ENTER WITH PL=# LINES, PC=# COLUMNS (PAGE=66 LINES) **
11300 REM** MACHINE LANGUAGE PROGRAM MUST BE LOADED BEFORE USING FORMS SET **
11310 IF SW=2 THEN PRINT:SYSTEM"FORMS D":SYSTEM"DUAL ON":PRINT#(2,0),CHR$(24):;R
ETURN
11320 SYSTEM"DUAL OFF":PRINT#(2,0),CHR$(24);
11330 A=PL*256+FC:X=USR0(A):RETURN
11400 REM** LOWER/UPPER CASE SHIFT UTILITY - SHIFT STRING=A **
11410 FOR XX=1 TO LEN(A):NU=ASC(MIDS$(A,XX,1)):MIDS$(A,XX,1)=CHR$(NU+(MIDS$(A,XX,1)
->"Z")*32):NEXT
11420 RETURN
11500 REM** CLEAR BUFFER AND FIELD
11510 FIELD 1,6 AS ANAN:MIDS$(ANAN,1,64)=SPACE$(64):FIELD 1,37 AS ANAN,B AS AMT,
1 AS CATS,1 AS STATUS$,10 AS CHKS,1 AS MO$,1 AS DAY,1 AS YEARS:RETURN
12000 REM*** ADD/MODIFY DATA SUBROUTINE
12010 A=INPUT$(1):IF ASC(A)>2 AND ASC(A)<32 THEN GOSUB 12250:GOTO 12010ELSE IF A
SC(A)=1 THEN 12340 ELSE IF ASC(A)=2 AND X<>5 THEN 12100
12020 PRINT#,;ON X GOSUB 12030,12090,12150,12190,12210,12230:GOTO 12010
12030 NU=37
12040 PRINT#(P(X),30),STRINGS$(NU,46):AI=SPACES$(NU):ST=32:PI=127:GOSUB 12440
12060 LSET ANAN=AI:PRINT#(P(X),30),ANAN:GOSUB 12560:RETURN
12090 NU=8

```

Listing continued

screen prompt. This calls up screen 7 (see Fig. 7).

Notice that the cursor appears to the right of the payee category. As you type in the dollar amount, the characters appear in reverse video. Press the enter key to record the figure and the numbers revert to normal video, indicating that the figure is saved.

Use the down-arrow key to position the cursor at the date category. Enter dates in the format 9.1.83 or 9/1/83. Should you make an error, 99/99/99 appears.

Hit the down-arrow key again, position the cursor by the amount category, and fill that in.

Afterward, bring the cursor to the check number category. If you are making a payment by personal check, press the F2 key and the check number is automatically posted.

If you've made any errors in the entries, use the up-arrow key to position the cursor beside the category containing the mistake and make the correction.

When you are satisfied that all your entries are correct, press the F1 key. Screen 8 appears with all the entries you've made displayed and with three options, listed at the bottom of the screen (see Fig. 8).

Pressing E lets you enter new data. If you press C, all new entries are cancelled and the program displays a message indicating that. You start off with a clean slate, so to speak.

Pressing S saves the data you enter. This operation is indicated in screen 9 (Fig. 9) and FTR assigns a number to that file.

A fourth option (not listed on the screen), R, brings you back to the main menu.

TASK #2: MODIFY DATA	
Use ARROW KEYS to position cursor. Type in data. Press [F1] key when all done.	
FILE NUMBER: <input type="text" value="1"/>	LAST CHECK #: 1235 (Press [F2] for NEXT Check #)
<hr/>	
Payee : Mrs. Jones (Week of 3 Jan 1983)	
Date : 1/7/83	
Amount : \$ 234.65	
Category: 2 - EMPLOYEE WAGES	
Check #: 1235	
Status (A=Active,D=Deleted) : R	

Figure 11. Modify data using this screen (screen 11).

TALLY SHEET - 31 Jan 1983				PAGE 1
(CATEGORIES: 1 TO 5)				
FILE#, DESCRIPTION	DATE	AMOUNT	CHECK NO.	CAT
10. H. Reese	1/15/83	\$275.00	CASH	1
11. T. Johnston	1/15/83	\$1125.00	186	1
12. Coast Office Supplies	1/15/83	-\$15.00	1240	3
13. Wauntanu Professional Society (DUES)	1/17/83	-\$50.00	1241	5
14. Mrs. Jones	1/21/83	-\$224.65	1242	2
15. J. Hancock	1/21/83	450.75	11-A-2576	1
16. Coast Office Supplies	1/23/83	-\$19.47	1243	3
18. W. Green	1/29/83	\$975.00	8799	1
19. Home Assurity (Office Insurance)	1/30/83	-\$250.00	1245	4
20. Mrs. Jones	1/31/83	-\$234.65	1246	2

Figure 12. A sample tally sheet.

Modifying Data

If you record an error from one of the screens and need to go back to correct it, select option 2, modify data, from the main menu and answer C to the continue/return prompt at the bottom of the task ID screen. The program asks you for the file number to be modified. Should you enter a nonexistent file number, screen 10 appears (see Fig. 10). Press C to try again. An appropriate response calls up screen 11 (see Fig. 11).

Screen 11 is almost identical to screen 8. The differences are that the file number is displayed and a status indicator appears (A for active, D for delete) that lets you keep or remove a record from your tally sheet. It doesn't delete the record, but ignores that file during a tally. Make your correction and press S to save the modified data.

Printing Category Definitions

You will need a permanent record of category definitions, obtained through menu option 5. After answering C at the task ID screen, you see the message "Bring Paper to Top of Page." Press the F1 key. FTR uses a machine-language utility to format reports at 66

PRICES YOU CAN'T BEAT!..

LNW-80 Model 11

128K, 5"8" DISK CONTR., RGB COLOR, HI-RES GRAPHICS, RS 232, PAR. PRINTER PORT, 80x24 DISPLAY, 1 YEAR WARRANTY, PLUS MICROSOFT BASIC, LNW BASIC, DOS+ 3.4, CPM 2.2, CHART-X GRAPHICS, MICROTERM, ELECTRIC PENCIL, ELECTRIC SPREADSHEET, PROF. BUSS, ACCTING (general ledger, accts. pay., accts. rec., payroll) **\$1959**

BUY THIS MONTH, GET A TEAC 40 TRK S/S **FREE**

COMPUTERS

PMC 81, 16K	\$499	32K EXPANDOR	\$375
TIMEX	\$56	16 MEM	\$42
APPLE CLONE (SYSCON 2)			\$599
TRS-80 COLOR COMP. 16K			\$269
TRS-80 MOD. IV, 64K, 240 TRK S/S			\$1,799

CRT MONITORS

AMDEK 300 GREEN	\$139
AMDEK 300 AMBER	\$159
AMDEK COLOR I	\$359
AMDEK COLOR II	\$639
TAXAN RGB COLOR I	\$299
TAXAN RGB COLOR III	\$535
TAXAN GREEN	\$125
TAXAN AMBER	\$139

TEAC 1/2 SIZE DRIVES

FD 55A 40TRK S/S	\$209	Bare	Compl
FD 55B 40TRK D/S	\$280		\$319
FD 55F 80TRK D/S	\$350		\$390

ALL TEACS HAVE A 1 YEAR WARRANTY

TANDON DRIVES

100-1 40TRK S/S	\$189	Bare	Compl
100-2 40TRK D/S	\$259		\$299
100-4 80TRK D/S	\$340		\$385

ECONOMY DRIVES

COMPLETE W/CASE/PWR SUPL/CABLE
40TRK S/S **\$195**

APPLE COMPATIBLE DRIVE

W CONTR CARD, CASE & CABLE **\$295**

C-ITOH PRINTERS

PROWRITER 8510	\$375	PAR	SER
PROWRITER 1550	\$579		\$525
F-10 40CPS	\$1195		\$1195
F-10 SSCPS	\$1475		\$1475
F-10 TRACTOR FEED			\$195
QUME SPRINT 11 40CPS			\$1,450

MODEMS

NOVATION J-CAT	\$135
SIGNALMAN	\$85

LNW SYSTEM EXPANSION II

UPGRADE YOUR MOD 1 OR PMC-80/81 WITH
DISK CONTROLLER · RS 232 · PARALLEL
PRINTER PORT · 32K 200 NS MEMORY · GOLD
CONNECTORS · TRANSFORM· CASE · CABLE

SPECIAL THIS MONTH \$339

EXPANSION INTERFACES

MICRO DESIGN MDX-2	\$449
MICRO DESIGN MDX-3	\$289
LNW DOUBLER w. DOS+ 3.4	\$189
DOUBLE DENSITY MULTIPLIER	\$95

SOFTWARE

LAZY WRITER	\$159	MULTIDOS	\$89
ELECTRONIC WEBSTER	\$119	SUPER UTILITY+	\$65
MAXI MANAGER	\$129	M A S 80	ca. \$135
POSTMAN	\$119	NEWSRIPT	\$114
DOS PLUS 3.4	\$89	OMNITERM	\$78

24 HOUR TOLL FREE ORDERS

VISA/MASTER CHARGE ONLY:
(800) 633-2252 EXT 720

ALL QUESTIONS: (313) 538-1112

MICHIGAN RESIDENTS ADD 4% SALES TAX-POSTAGE
CALL FOR CHARGES-PRICES ARE DISCOUNTED FOR
CASH AND MONEY ORDER (NON CERTIFIED CHECKS
ALLOW 2 WEEKS TO CLEAR) MASTER CARD AND VISA
ADD 3% NO C.O.D. NO NET TERMS

VESPA COMPUTER OUTLET
16727 Patton Detroit MI 48219

Listing continued

```

12100 GOSUB 12540:AI=SPACES(NU):ST=46:FI=58:GOSUB 12440
12110 IF ASC(AI)=13 THEN DTE=" " ELSE DTE=LEFT$(AI,J)
12120 GOSUB 1000:LSET MO$=CHR$(MO):LSET DAY=CRR$(DAY$):LSET YEARS=CBR$(YEAR$):PR
INT8(P(X),38),,:PRINTUSINGDFP:ASC(MO$):ASC(DAY$):ASC(YEAR$):GOSUB 12568
12130 RETURN
12158 NU=9
12160 GOSUB 12540:AI=SPACES(NU):ST=45:FI=58:GOSUB 12440
12170 LSET ANT=NKDS$(VAL(AI)):PRINT8(P(X),29),,:PRINTUSING"#####.##";CVD(AMT)
12180 GOSUB 12560:RETURN
12190 NU=2:PRINT8(P(X),38),DN,CHR$(23),DR:GOSUB 12540:AI=SPACES(NU):ST=40:FI=58:
GOSUB 12440:LSET CAT$=CHR$(VAL(AI))
12200 PRINT8(P(X),38),,:PRINTUSING"##";ASC(CATS):PRINT" - ";A(ASC(CAT$)):GOSUB
12568:RETURN
12210 IF ASC(A)=2 THEN AI=STR$(VAL(A(100))+1):J=LEN(AI):SV=1:PRINTDN; ELSE NU=10
:SV=0:GOSUB 12540:AI=SPACES(NU):ST=32:FI=90:GOSUB 12440
12220 RSET CHKS$=LEFT$(AI,J):PRINT8(P(X),38),CHKS$:GOSUB 12560:RETURN
12230 NU=1:GOSUB 12540:AI=" " :ST=65:FI=68:GOSUB 12440:IF AI<>"D" THEN AI="A"
12235 LSET STATUS$=AI:PRINT8(P(X),38),AI:GOSUB 12560:RETURN
12240 REM** SCREEN CURSOR MOVEMENT
12250 P=ASC(A):IF P>30 THEN X=X-1 ELSE IF P=31 THEN X=X+1
12260 IF X># THEN X=X-1 ELSE IF X=7 THEN X=6
12270 IF SR=1 AND X># THEN X=5:GOTO 12560 ELSE 12560
12280 REM** SAVE DATA ROUTINE
12290 PRINT8(22,5),DN,CHR$(24):DR," ave this data, ";DR;" C ";DN;" cancel
any NEW entries, or ";DR;" E "ENTER more data...";A=INPUT$(1):GOSUB 11410
12300 IF A="E" THEN PRINT8(22,0),CHR$(24);:GOSUB 12560:GOTO 12010
12310 IF A="C" THEN PRINT8(5,25),CHR$(23):DR," ** ALL NEW ENTRIES CANCELLED ** "
:DN;:GOSUB 11510:RETURN
12320 IF A<>"S" THEN 12350 ELSE PRINT8(5,25),DR," SAVING DATA... ";DN;SPACE$(18);
12330 IF SR=1 THEN LSET STATUS$="A"
12400 PRINT8(5,42),"DATA SAVED IN FILE NUMBER ";DR,RN,DN,CHR$(23);:PUT 1,RN:IF S
V= THEN LSET ACAT=STR$(VAL(CHKS)):A(100)=ACAT:PUT 2,100
12402 RETURN
12410 PRINT8(22,5),CHR$(23),CHR$(2):,FOR1=1TO:PRINT8(22,18),MSG$,:FOR2=1TO900:N
EXT:PRINT8(22,10),CHR$(23);:FOR2=1TO200:NEXT:NEXT:PRINTCHR$(1);:GOTO 12350
12440 REM** INPUT SUBROUTINE
12450 J=0:GOTO 12470
12460 IF J=NU THEN 12530 ELSE A=INPUT$(1)
12470 IF ASC(A)=13 THEN 12520 ELSE IF ASC(A)=2 THEN A=CHR$(163):GOTO 12500
12480 IF ASC(A)=8 AND J>0 TBEN J=J-1:A=CHR$(174):GOTD 12500 ELSE IF ASC(A)=8 THEN
12460
12490 IF ASC(A)<ST OR ASC(A)>FI THEN GOSUB 12540:GOTO 12460
12500 J=J+1:MIDS(AI,J,1)=A:PRINT8(P(X),29+J),A,:IF A=CHR$(174)THEN J=J-1:PRINT8(
P(X),30+J),,
12510 GOTO 12460
12520 FOR Z=J-1 TO NU:MIDS(AI,Z,1)=" ";NEXT
12530 PRINTDN:,RETURN
12540 REM** CLEAR POSITION OF BAD DATA
12550 PRINT8(P(X),30),STRINGS(NU,46)
12560 PRINT8(P(X),30),,:RETUN
12740 REM** ADD/MODIFY SCREEN DRAWING SUBROUTINE
12750 PRINT8(2,0),CHR$(24),"Use ARROW keys to position cursor. Type in data. Pre
ss ";DR;" F1 ";DN;" key when all done.":PRINTDLN
12755 PRINT8(5,0),"FILE NUMBER ";DR,:IF SR=1 THEN PRINT" NEW ";DN ELSE PRINTRN;
DN
12757 PRINT8(5,25),"LAST CHECK #";VAL(A(100));" (Press ",DR," F2 ",DN," for NEX
T Check #)"
12760 PRINT8(7,0),DN:PRINT8(9,20),"Payee : ";STRINGS(37,".")
12770 PRINT8(11,20),"Date : ..../..../.."
12780 PRINT8(13,20),"Amount : $....."
12790 PRINT8(15,20),"Category: .."
12800 PRINT8(17,20),"Check : ....."
12810 IF SR=2 TBEN PRINT8(19,0),"Status (A=Active,D=Deleted) : ."
12820 PRINT8(9,30),,:RETURN
15000 REM** ERROR TRAPPING ROUTINE
15010 PRINT DR:CLS:PRINT8(9,25),"ERROR #";ERR;" OCCURRED IN LINE #";ERL
15020 IF ERR=56 THEN PRINT8(10,25),(Printer Not Available)"
15030 PRINT8(11,25),"Press ANY Key to Continue...";
15040 A=INPUT$(1):PRINT DN:RESUME 500

```

lines long and 80 characters wide. The continue and return prompt reappears as a last-minute opportunity to make any changes you want.

Pressing C prints the list of category definitions to be generated. If an error occurs, the program displays an error message and returns you to the main menu. When the categories are printed, the message "Printing Completed. Press ANY key to continue." appears.

Printing Tally Sheets

FTR's primary purpose is compiling tally sheets. Select task 3 from the main menu and answer C to the task identification screen. When the next screen appears, press the F1 key to get the tally sheet printed out or F2 to have the tally sheet displayed on the video screen. In either event, the continue and return to main menu options are displayed at the bottom of the screen.

If you press F1, the message "Bring Paper to Top of Page" appears. If you then press C, the screen clears and the prompt Print (F)ull Tally Sheet or a (P)ortion appears. A full tally sheet contains all records on file, a portion lets you select a range of records and a range of categories.

If you select a portion of a tally sheet, the program prompts you for starting and ending records. You are then asked the start and ending points for tally sheet categories. See Fig. 12 for a sample tally sheet.

Getting Started

Enter the program in Listing 1 and save it under the name FTR. FTR uses a short, machine-language utility, FRMS, to automatically set forms. Since you'll be in Basic, type SYSTEM and press the enter key. When TRSDOS READY appears, type DEBUG ON. Type MF000 and press the F1 key. The standard Debug display appears on the first video (F000) line. Now type 56234E06423E 11CFC9. Check all characters for accuracy. Then press the F2 and escape keys and press the O key. Type DUMP FRMS (START = F000, END = F000). When TRSDOS READY again appears, your directory should show a new file, FRMS. You're now ready to keep track of your financial transactions. ■

LIMITED OFFER

NEWDOS - 80 ver. 2.0
and DOSPLUS ver. 3.4

A combined regular price of
\$299.96

Now \$149.00 combined
price

or call for separate pricing. Offer
subject to cancellation without
notice.

CALL TOLL FREE
800-835-0071

In Kansas
316-665-3811

SALES
DATA, INC.

528 E. 4th >142

HUTCHINSON, KANSAS 67501

FINALLY!!

ARCADE GAMES AND
GOOD GRAPHICS FOR

MODEL 2, 12, 16

\$19.95 each - or two for \$29.95!

Galactic Invaders.....Munchman
Quest for Adventure.....Metroids
Space Trek.....Wormy
Computer Casino.....Bust-out
The Wrath of Ken.....Chess
Racer X.....Othello

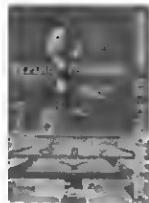
Call or write for full game list
KUZEL COMPUTER SERVICES
8654 W. Berwyn Ave. #3S
Chicago, Illinois 60656
(312) 399-0273

>354

Contact Jim Barbarello at R.D. #1,
Box 241H, Tennent Road, English-
town, NJ 07726.

Instant
Typing

NOW FOR MODEL 100



Say "Goodbye" to the awkward hunt & peck method of typing! Instant Software introduces you to Typing Teacher—the patient tutor that will improve your typing skills. This complete seven-part package takes you all the way from initial familiarization with the keyboard, through words and phrases, to complete mastery of the keyboard.

On screen diagrams show you the correct placement for fingers. Displays keep eyes up and away from keyboard to master proper techniques.

Take home TYPING TEACHER today and type like a pro tomorrow.

Requires: TRS-80* Model 100. 8K #0463RH \$17.95.

TRS-80*, Tape, Mod I and Mod III. 16K. #0099R \$17.95

TRS-80 Disk Model I & III w/CONVERT, or PMC, 16K, #0451RD \$22.95

YES! Send me
Instant Typing
from Instant Software.

0463RH@\$17.95

0099RD@\$17.95 0451RD@\$22.95

Please add \$2.50 for postage & handling.

VISA, MASTERCARD,
AMERICAN EXPRESS ACCEPTED.

Card#

MC Bank# Expires

Signature

Name

Street

City

State Zip

OR CALL TOLL FREE 339B8T
1-800-258-5473

✓597

Instant Software
Rt. 101 & Elm St.
Peterborough NH 03458

Instant Software

*TRS-80 is a trademark of the Radio Shack Division of Tandy Corporation.

WE'RE SERIOUS ABOUT FUN!

Software for
Radio Shack's TRS-80
MODELS II/12/16

- GAMES • ADVENTURE
- BUSINESS • LANGUAGE
- EDUCATION

CALL OR WRITE FOR FREE
BROCHURE AND MORE INFORMATION

 **Rizzo Data
Systems Corp.**

577 Burlington Rd., P.O. Box 458
Bridgewater, NJ 08302-0356
609/451-7979 ✓518

SPECIAL OFFER!!
Model I or Model III
9 Programs Worth
\$3300
for
\$7995
\$250 Handling

Reg. Price

Personal Finance	\$1495
Dome Bookkeeping	\$2995
APL-80	\$3995
Pascal-80	\$9995
9 Games for Preschoolers	\$1495
Tiny Comp (BASIC Compiler)	\$2495
Inventory	\$5995
Floppy Disk Diagnostic	\$2495
Typing Tutor	\$1995

\$3300

Sold as a package only
for \$7995 (disk only) ✓401

RAMPARTS
Box S-8, Gulf Road
Greenfield, NH 03047 1-603-547-3553
Offer expires September 30, 1983

YOU CAN SEND YOUR MESSAGES USING

E-COM™ TRADEMARKED BY THE UNITED STATES POSTAL SERVICE

MICRO-ECOM™

"We make E-COM® friendly"

MICRO-ECOM™ transforms typed messages into complex E-COM® formats ready for easy transmission to Serving Post Offices. Draw graphics right into your messages. Use all E-COM® message types in each transmission. There won't be much to do but type messages in your word processor. Use MICRO-ECOM™ to prepare the transmittable E-COM® files. \$395 buys the entire package—programs on disk, (150 pages of clear documentation,) Direct or on-line support. (For TRS-80 Models 1,2,3,4,12 & 16 plus other computers using Microsoft BASIC).

Send check or money order to:

TODAY'S FUTURE, P.O. BOX 29251

San Antonio, TX 78229 ✓320

Office: (512) 684-6505

Computer: (512) 684-6218

Brochure available:

VISA/MC

TRAILER

ALL SERVICE ELECTRONIC COMPUTER

1-800-328-1223

Minnesota residents call:

612-544-4720

EARLY GAMES FOR YOUNG CHILDREN

Nine educational and entertaining games controlled by a single program. Even very young children can select a game, play it, and select a different game...ALL BY THEMSELVES!

- PICTURE MENU GIVES CHILDREN CONTROL
- MATCH NUMBERS AND LETTERS
- COUNT COLORFUL BLOCKS
- ADD AND SUBTRACT STACKS OF BLOCKS
- LEARN THE ALPHABET
- PRACTICE SPELLING NAMES
- COMPARE SHAPES
- DRAW AND SAVE COLORFUL PICTURES

The large numbers and letters fill the screen with color. Children enter single key stroke responses and get immediate visual and musical feedback. Hints are provided when appropriate. Beyond just teaching children basic skills, EARLY GAMES makes them feel comfortable as they control the computer. Designed for children ages 2½ to 6 years old.

EARLY GAMES offers the child a diverse selection of activities which stimulate the process of problem solving as well as foster individual creativity.

Pamela Bach, Director
Youth World Day Care Center

I took EARLY GAMES home for my kids and they really liked it! It held their attention and they learned from it!

Jeanette Fritze
Computer Saleswoman

EARLY GAMES can help children learn new concepts, information, and skills and also introduce them to the joys and benefits of home computers.

Peter Clark, faculty
Institute of Child Development
University of Minnesota

All nine games for \$29.95
(Minnesota residents add 5% sales tax)

Apple II Plus
IBM Personal Computer
Atari 24K Disk or 16K Cassette
TRS-80 Model I/II/III 32K Disk or 16K Cassette
TRS-80 Color Computer 16K Disk or Cassette

VISA

MasterCard

VISA/MasterCard

EARLY GAMES

educational software

Suite 140E

Shelard Plaza North

Minneapolis, MN 55426

1-800-328-1223

Minnesota residents call:

612-544-4720

Business Bazaar

They are nightmares common to all business managers at one time or another: an employee's paycheck gets lost in an overflow of paperwork in the manager's office; a client's file is overlooked, resulting in delayed payment; the bookkeeper leaves you muttering, "Where did all the money go?"

More and more companies and small businesses use microcomputers to help them maintain and process vast amounts of valuable information. To meet the demand, software manufacturers have written business software that satisfies just about any office requirement.

This Buyer's Guide provides a sampling of the various business packages available to TRS-80 owners. Besides payroll, general ledger, accounts payable/receivable, invoice, and inventory programs, there's quite a selection of software for both unusual applications and specific industries.

Among the programs that passed our desks were software designed to test and evaluate manager response to different situations, a bookkeeping system developed specifically for gas stations, a construction template program to help contractors determine accurate estimates, an aircraft maintenance program, and several software packages designed for use by Amway distributors.

For each software manufacturer that submitted programs to this guide, we've written a brief summary of what the program does, how much it costs, TRS-80 compatibility, and, where necessary, the program's limitations (listed in parentheses at the beginning of the program description).

Some software manufacturers produce several business programs, so we've included only one or two samples of their product line. You should contact these companies for a catalog and further information regarding their software.

For those of you who already have an inkling of the type of business software you need, quick-reference charts are provided. Listed under each are the names of the manufacturers who make relevant software. Refer to the text for further descriptive information concerning those programs, and for the company's address and phone number.

When reading through this Buyer's Guide, please remember that these listings are based on information supplied by the manufacturer. We have not tested or reviewed these products, and cannot guarantee manufacturer claims. Also, the price of some of these software packages may change by the time you read this issue, so contact the manufacturer for updates on newly released software programs and for revised program prices. ■

BLECHMAN ENTERPRISES

7217 Bernadine Ave.
Canoga Park, CA 91307
213-346-7024

SMALL HOME BUSINESS PROGRAMS

(Model I Level II and Model III)

These six programs are designed for the entrepreneur who operates small home-based businesses like Amway and Avon distributorships, and mail-order, insurance, and real estate businesses. All programs are provided on one cassette for \$49.95. Documentation is included. Listings and documentation can be purchased for \$20.

SPEED LETTER: A crash-proof program that generates letters and forms. There are only 10 commands, with

seven of them in a screen menu. Features include review text, save text, read text, add or delete lines, left margin control, automatic paging with numbers, print all or part of text, uppercase and lowercase letters, and holds up to 150 lines of text in 16K of memory.

LEDGER: A 12-column ledger that prints out income or expenses with page, month, and grand totals on standard 8½-inch-wide paper. Column 1 is the income or expense amount. The user assigns the other 11 column headings.

MAILING LABELS: Handles 220 names and addresses. Data is sorted on entry by zip code, name, city, or user-defined code. Labels are printed three across, four lines each on either self-adhesive stock or plain paper.

AUTO-DIALER/TIMER: Stores up

to 500 names and phone numbers. User types in the name to be dialed through a \$3 Radio Shack interface relay. Elapsed time is displayed on the screen, and the computer redials the last number entered. Schematic to connect phone is included, and no computer modifications are required.

TOLL CHARGE: Real-time display of phone charges by the second.

INVOICE: Products and prices are stored in memory. The program does all the necessary calculations. A standard 80-column printer is required.

Blechman Enterprises also makes business-related software for Amway distributors. Software packages include Order Verification/Generation, Monthly Bonus Calculation, Monthly Gross Profit, Distributor Family Tree, Ledger, and much more.

**C. F. KERCHNER &
ASSOCIATES INC.**
5507 Louise Lane-E. Allen Twp.
Northampton, PA 18067
215-262-1276

**MANUFACTURING INVENTORY
CONTROL (Models I, II, and III)**

A menu-driven, user-friendly, four-level inventory control system that reduces the time and expense of inventory control for the small manufacturer. This system helps control parts, subassemblies, assemblies, and finished goods. It assists in inventory control, purchasing control of parts orders, accounting reports, and material requirements planning. Features of this system include inventory-level reports, below-minimum reports, parts lists, accounting reports, work sheets, on-order reports, parts pick lists/pull sheets, bills of material processing, and much more. Model I/III versions cost \$299.95, and the Model II version sells for \$349.95. Neither comes with a warranty, but you can purchase a sample test data disk for \$29.95 to determine whether or not it's compatible with your needs.

**PURCHASING AIDS PACK 01
(Models I, II, and III)**

A programmed approach to determine the recommended purchase quantity of an item given a certain set of facts. It prompts you for information concerning the buy choices, order processing costs, freight costs, inventory carrying costs, financing costs, the desired return on investment, and so forth. The output summarizes all these facts and then, using several equations, determines the recommended purchase quantity. Cassette versions are available for \$19.95, and disks sell for \$39.95. If you have a Model I, you must specify whether it is a Level I or II.

**PRODUCTIVITY AND QUALITY
ANALYSIS (Models I and III)**

This system determines a productivity index and quality level index for work performed by assembly or production workers in a small manufacturing firm. It sorts data typed in from simple job cards and quality control inspection tickets to tell you which workers and which jobs are above, on, or below standard. When updated daily, this lets supervisors keep an objective daily pulse on the shop. Plotting the daily reports by worker gives you an objective measuring tool to discuss

workers' performance. Cassettes of this system cost \$29.95 and disks cost \$39.95.

COLOR SOFTWARE SERVICES
P.O. Box 1708
Greenville, TX 75401
214-454-3674

**SERIES I: BEING BOSS
(Color Computer)**

Comprises six programs. Being Boss is the first in an ongoing series of computer-assisted management development tools. These programs provide information and guidance for those who are new to management or who want to improve managerial skills. The program contains the following management development aids: Reflections, a self evaluation guide; Assertiveness, learning to take control as a leader; Management Styles, how to approach the leadership role; Decision Making, how to handle decision making; Counseling, helping others solve personal problems; and Stress Control, learning to take care of yourself. Each of these programs is in a multiple-choice questionnaire format where the user is queried on his response to certain situations. A printed evaluation of your performance is provided after you complete the entire questionnaire. This program, which comes on cassette, sells for \$89.95.

**ACCOUNTS RECEIVABLE (Color
Computer) (16K Extended Basic)**

Provides the user with detailed audit trails and history files on all transactions by a customer. It also prepares invoices, mailing labels, aging lists, customer history reports, and an alphabetized customer listing. The user can define discount/net terms for commercial accounts, and finance charges and minimum payments for revolving accounts. This program is suited for integration into the Colorsoft Small Business Accounting Package, and costs \$89.95.

**SMALL BUSINESS ACCOUNTING
(Color Computer) (16K Extended
Basic)**

An integrated ledgerless accounting package for a small business. The package includes Accounts Payable, Accounts Receivable, Sales, and Purchase Order programs. It produces income statements, balance sheets, check

**Quick reference chart
to listed software
packages.**

**ACCOUNTING AND
GENERAL LEDGER**

Blechman Enterprises
Color Computer Software
Color Software Services
Computer Systems Research Inc.
Computronics Inc.
Custom Data
Eltech Associates
G&G Cunningham, CPAs
Holman Data Processing
Howe Software
Lizcon Trading
Micro Architect Inc.
ProSoft
Shawmut Systems
Small Business Systems Group
Taranto & Associates Inc.
TSASA Inc.
Univair International

**BILLING/ACCOUNTS
RECEIVABLE & PAYABLE**

Color Computer Software
Color Software Services
Computer Systems Research Inc.
Computerware
Computronics Inc.
Custom Software Services
Holman Data Processing
Micro Architect Inc.
Shawmut Systems
Small Business Systems Group
Southwest Systems
Taranto & Associates Inc.
The Software Establishment
The Software Terminal
TSASA Inc.
Univair International

BUDGET AND FORECAST

C.F. Kerchner & Associates
Computronics Inc.
Howe Software
Micro 80 Inc.
Southwest Systems
TSASA Inc.

CASH MANAGEMENT

Computerware
Computronics Inc.
Demi-Software
Micro Architect Inc.
Taranto & Associates Inc.
TSASA Inc.

Continued

DATA-BASE MANAGEMENT

Color Computer Software
Data Management Systems
Howard W. Sams & Co. Inc.
Howe Software
Micro Architect Inc.
Micro 80 Inc.
Universal Data Research Inc.
XYZT Computer Dimensions Inc.

FINANCIAL ANALYSIS

Computronics Inc.
Howard W. Sams & Co. Inc.
ProSoft
R.R. Belanger, Ph.D.

INVENTORY CONTROL

C.F. Kerchner & Associates
Color Computer Software
Computer Systems Research Inc.
Computerware
Computronics Inc.
Eltech Associates
Lizcon Trading
Micro Architect Inc.
Small Business Systems Group
Taranto & Associates Inc.
The Software Terminal
TSASA Inc.
Univair International

INVESTMENT ANALYSIS

Computronics Inc.
Good Software Corp.
TSASA Inc.

INVOICE CONTROL

Blechman Enterprises
Computer Systems Research Inc.
Eltech Associates
Lizcon Trading
Small Business Systems Group
Southwest Systems
Taranto & Associates Inc.

PAYROLL

Color Computer Software
Computerware
Computronics Inc.
Custom Software Services
Micro Architect Inc.
Shawmut Systems
Small Business Systems Group
Southwest Systems
Taranto & Associates Inc.

registers, accounts payable and receivable status lists, and accounts payable and receivable aging reports. The program handles sales of up to \$1 million and approximately 800 accounts payable/receivable during each user-defined accounting period. Accounts are automatically numbered and each transaction is carried separately such that an account number will correspond to a specific purchase rather than a specific vendor/customer. This system is available for \$89.95.

GENERAL LEDGER (Color Computer) (16K Extended Basic)

An integrated, journal-type double entry accounting package for a small business that includes the General Ledger, Accounts Payable, and Accounts Receivable programs. The system provides you with income statements, balance sheets, accounts payable and receivable status lists, accounts payable and receivable aging reports, journal reports, account listings, and closing summaries. During each accounting period (as defined by the user), the system handles 800 accounts payable/receivable up to \$1 million each. All accounts are automatically numbered. This accounting package costs \$129.95 and is designed for integration with future software modules such as a payroll system, inventory, and so on.

COMPUTER SYSTEMS RESEARCH INC. 66 Rockland St. North Easton, MA 02356 617-331-0450

ACCOUNTING MASTER PROGRAM (Models II, III, and 16)

This program works with either the Inventory and Order Entry program or by itself as an accounting package. Combined with the Order Entry program, you can produce invoices with items, credits with items, and payables to accounts. Used alone, it stores up to 800 customer accounts and provides you with Delinquent Reports, Active Accounts, Full Lists, Billing Statements, Transaction Reports, and Mailing Labels. This program keeps track of accounts receivable quickly and efficiently. It sells for \$200.

INVENTORY MASTER PROGRAM (Models II, III, and 16)

This program stores up to 1,300 inventory items. You can add, modify,

delete, and inquire about any desired item. Manual inventory transactions include Sell, Adjust, Receive, and Order. The program also provides you with inventory lists and purchasing reports. Your customer can use this software program as a stand-alone package for inventory control, or use it together with the Order Entry and Accounting programs. This program costs \$200.

ORDER ENTRY MASTER PROGRAM (Models II, III, and 16)

This program operates only with the other two in order to function. It draws from and posts to the Accounting Master File for customer information, and does the same with the Inventory Master File for product sales information. It handles sales, credits, and payments, but its real worth is in detailed invoicing with items. Here, it keeps track of line totals, invoice totals, and state and federal taxes. On a four-drive Model III, you can store up to 1,800 transactions per month. This program costs \$200.

Other offered programs include Multi-Location Inventory Control, Mailing List, Part Number Cross Reference Program, Invoice Control, and more.

COMPUTERWARE P.O. Box 668 Encinitas, CA 92024 619-436-3512

CHECK LEDGER (Color Computer)

A single-entry bookkeeping system that lets the user define a chart of income and expense accounts. Reporting capabilities include detail account, summary account, written checks, outstanding checks, adjustments, and deposits. Year-to-date dollar totals are maintained for each account, as well as a complete checking account history. Manual account corrections is provided. It sells for \$195.

INVENTORY CONTROL (Color Computer)

Designed to help the retailer, distributor, or businessperson keep control of inventory. The program stores cost and quantity information, updates it immediately, and offers key management report summaries at any time. Formatted reports include General Inventory Report, Cost Extension List, Retail Extension List, Profit Margin Report, Price List, Count List, and Year-to-Date Monthly Sales. You are

Now NRI takes you inside the new TRS-80 Model 4 microcomputer with disk drive to train you at home as the new breed of computer specialist!

NRI teams up with Radio Shack advanced technology to teach you how to use, program and service state-of-the-art microcomputers...

It's no longer enough to be just a programmer or a technician. With microcomputers moving into the fabric of our lives (over 1 million of the TRS-80™ alone have been sold), interdisciplinary skills are demanded. And NRI can prepare you with the first course of its kind, covering the complete world of the microcomputer.

Learn At Home In Your Spare Time

With NRI training, the programmer gains practical knowledge of hardware to design simpler, more effective programs. And, with advanced programming skills, the technician can test and debug systems quickly and easily.

Only NRI gives you both kinds of training with the convenience of learning at home. No classroom pressure, no night school, no gasoline wasted. You learn at your convenience, at your own pace. Yet

you're always backed by the NRI staff and your

instructor, answering questions and giving you guidance.

TRS-80, Model 4 plus Disk Drive to Learn on and Keep

NRI training is hands-on training with practical experiments and demonstrations. You not only learn to program your computer, you learn all about it...how circuits interact...interface with other systems...gain a real insight into its nature. Under NRI's carefully planned training, you even install a disk drive, verifying at each step its operation.

You also work with a professional 4-function, 3½ digit digital multimeter and the NRI Discovery Lab® performing over 60 separate experiments. Both microcomputer and equipment come as part of your training for you to use and keep.

Same Training Available With Color Computer

NRI offers you the opportunity to train with the TRS-80 Color Computer as an alternative to the Model 4. The same technique for getting inside is enhanced by using the new NRI-developed Computer Access Card. Only NRI offers you a choice to fit your specific training needs.



Now training includes either the TRS-80 Model 4 Microcomputer with Disk Drive or TRS-80 Color Computer with Computer Access Card; professional LCD multimeter; the NRI Discovery Lab; and hundreds of demonstrations and experiments. (TRS-80 is a trademark of the Radio Shack division of Tandy Corp.)



The Catalog is Free. The Training is Priceless.

Get all the details on this exciting course in NRI's free, 104 page catalog. It shows all equipment, lesson outlines, and facts on other electronics courses such as Electronic Design, Industrial Electronics, Video/Audio Servicing...12 different career opportunities in all.

Keep up with the latest technology as you learn on the latest model of the world's most popular computer. If coupon has been used, write to NRI Schools, 3939 Wisconsin Avenue, Washington, D.C. 20016.



All career courses
approved under GI Bill
 Check for details



NRI Schools
McGraw-Hill Continuing
Education Center
3939 Wisconsin Avenue
Washington, D.C. 20016

We'll give you tomorrow.

The catalog is free.
The training is priceless.

Please check for one free catalog only.

- Computer Electronics including
Microcomputers
- Color TV, Audio, and Video System Servicing
- Electronics Design Technology
- Digital Electronics
- Communications Electronics • FCC Licenses
• Mobile C.B. • Aircraft • Marine

- Industrial Electronics
- Basic Electronics
- Small Engine Servicing
- Appliance Servicing
- Automotive Servicing
- Auto Air Conditioning
- Air Conditioning, Heating,
Refrigeration, & Solar Technology
- Building Construction

Name _____

(Please Print)

Age _____

Street _____

City/State/Zip _____

Accredited by the Accrediting Commission of the National Home Study Council

#179-093

provided with four costs, four locations, selling history, and vendor information for each item. The program costs \$195.

PAYROLL (Color Computer)

Besides collecting key employee information, this program allows entry of pay rates for standard hours, overtime, and salary. Hourly, salary, and commissioned employees may be paid weekly, bi-weekly, semi-monthly, or monthly. You can sort all the reports by employee number, social security number, employee name, or state code. The program automatically reports federal and state taxes, and permits changing tax rates and maximums according to government changes. The program comes with password protection and sells for \$295.

ACCOUNTS PAYABLE (Color Computer)

This program collects vendor invoice information and reports the business' cash commitments and payment history. For each invoice entered, the program stores the invoice number, ven-

dor, invoice date, invoice amount, and payment document number. Reports include Account Cross Reference, Account Master, Account Summary, Accounts Past Due, Payment Forecast, and Activity. These may be sorted by vendor number, vendor name or invoice date with range selection available for selective reporting. The system is available for \$195.

ACCOUNTS RECEIVABLE (Color Computer)

Provides reliable and timely information regarding the status of all customer accounts. The program tells you which accounts are past due, forecasts how much money to expect for cash flow planning, and keeps you on top of your customer's credit positions. Customer name, address, credit limit, invoice, and payment information is recorded. Available reports include Account Summary, Account Overdue, Account Aged, Payment Forecast, Audit Trails, Account Master, and Account Cross Reference. This system sells for \$149.

Data's already successful Church Donations program, while the Custom Ledger is a stand-alone program. Both programs allow the user to track five separate checking accounts with five account types and nine categories under each account type. The Church Ledger permits 100 general-ledger accounts and 570 transactions per month, and the Custom Ledger allows 200 general-ledger accounts and 2,175 transactions per month. Both generate a chart of accounts, a trial balance, a statement of income and expenses, a balance sheet, a transaction journal, a check register, checkbook reconciliation, a budget report, and a sessions transaction journal. For those with two-disk-drive systems, the Model III version costs \$180, and the Model II, 12, and 16 versions cost \$225. Four-disk-drive systems cost \$199 for the Model III, and \$249 for Models II, 12, and 16.

CUSTOM SOFTWARE SERVICES

P.O. Box 150
Porterville, CA 93258
209-784-7966

ENHANCEMENTS TO R/S PAYROLL (Models II, 12, and 16)

Improvements to Radio Shack's payroll program increase capacity to 999 employees on hard disk (475 employees with a two-disk-drive system), replaces the Basic sort with a machine-language sorting program capable of sorting 999 employees and creating an index file in under a minute, allows escaping from a displayed employee's check during payroll processing without creating the check, sends the screen's contents to the printer during editing and payroll processing sessions, and adds the amount of the check in word form to all payroll checks.

The enhancements are available for \$100, and a copy of your R/S Payroll must accompany your order to verify that you have purchased the program. The disk is reformatted under TRSDOS 2.0 and the improved versions of each program are copied to your disk.

ACCOUNTS RECEIVABLE SYSTEM (Models II, 12, and 16)

Designed for trucking companies, this system handles up to 300 customers, 500 transactions per customer each month, with a maximum of 7,600 transactions each month when used on a three-disk-drive system. Also included are five load-management programs for

TRS-80 MODEL III ASSEMBLY LANGUAGE

A complete course in assembly language, written for the beginner. Basic concepts, the Z-80 instruction set, complete Model III ROM and RAM information, programming examples, the disk controller, the TRSDOS 1.3 operating system, RS-232-C interface.

With the book you can also purchase Monitor #5, a comprehensive machine language monitor (specify Model 1 or 3).

Book only \$16.95
Book and Monitor #5 on disk \$29.95

HOME BUDGET

Analyzes your income and expenses, computes monthly and year-to-date summaries showing income tax deductions.

Model 1/3/4 disk version \$49.95
Model 1/3/4 cassette version \$29.95
Model 2/12 or IBM/PC version \$59.95

SMALL BUSINESS ACCOUNTING

Based on Dome Bookkeeping Record #612, this program keeps track of income, expenses, and payroll (not included in cassette version) for a small business.

Model 1/3/4 disk version \$59.95
Model 1/3/4 cassette version \$29.95
Model 2/12 or IBM/PC version \$69.95

FREE Software Catalogue

Add \$3.00 postage & handling.
New York Residents add sales tax.

Howe Software

14 Lexington Road
New City, New York 10561

(914) 634-1821

Visa and MasterCard accepted.

*TRS-80 is a trademark of Tandy Corp.

COMPUTRONICS INC.
50 N. Pascack Road
Spring Valley, NY 10977
800-431-2818

BUSINESS PAC 100
(Models I, II, and III)

Comprises 100 ready-to-run business programs ranging in interest from inventory control to payroll, and from bookkeeping systems and stock calculations to checkbook maintenance and accounts receivable/payable. Contact Computronics for their 64-page software catalog for more detailed information on the above programs, and also inquire about their VersaBusiness series of business software. Model I and III versions are available on disk or cassette for \$99.95, and Model II versions are available on disk for \$149.95.

CUSTOM DATA
1100 New York Ave.
P.O. Box 1066
Alamogordo, NM 88310
505-434-1096

CHURCH/CUSTOM LEDGER
(Models II, III, 12, and 16)

Two comprehensive general-ledger programs. The Church Ledger is designed to interface with Custom

billing on a per-barrel, per-gallon, per-ton, per-hundred weight, and percentage of hundred weight basis.

The system generates a complete set of reports, including sales analysis reports and year-to-date summaries for each customer, as well as standard statements and invoices. This accounting system is priced at \$500.

DATA MANAGEMENT SYSTEMS
211 N. El Camino Real
Suite 101C
Encinitas, CA 92024
619-942-0744

CCDS (Model I6)

CCDS is a relational data-base system. The user views data as simple collections of flat files or tables, and each row of a table is viewed as a data record. Records may be selected based on data values, and specified fields of each record are displayed or printed. In addition, you can combine data from different files and display or print the combination. Standard and formatted reports and displays can contain derived fields, and users can enter simple English

queries for retrieval. CCDS is offered at an introductory price of \$595 and comes with a 30-day trial period.

DEMI-SOFTWARE
6 Lee Road
Medfield, MA 02052
617-359-4502

DEMI-PLAN: PROJECT MANAGEMENT SYSTEM (Models I and III) (48K)

A project management program for defining and maintaining a file of project tasks and resources. The information is used to print various forms of Gantt Charts, Resource Histograms, and Task/Resource reports. The system determines the critical path of a project, and lets the project manager introduce "what-if" data to test the effect of date and resource changes on the project's completion date. It sells for \$49.95 postpaid, and documentation only costs \$5.

Demi-Software manufactures numerous business-related programs other than their Project Manager System. A sampling includes Personal Finance Package, Mailing List, Label Printer,

Continued from p. 154

PURCHASE ORDER

Color Computer Software
Computer Systems Research Inc.
Computronics Inc.
Eltech Associates
Micro Architect Inc.
Southwest Systems
Taranto & Associates Inc.
TSASA Inc.

REPORT/MAILING LIST GENERATOR

Blechman Enterprises
Color Computer Software
Computer Systems Research Inc.
Demi-Software
Howe Software
Micro Architect Inc.
Small Business Systems Group
XYZT Computer Dimensions Inc.

STOCK MARKET

Computronics Inc.
Management Services
Micro Architect Inc.
Star Value Software
Think Software Inc.
TSASA Inc.

Continued on p. 159



\$995 MICROMERLIN™

128K RAM
RS232 Serial I/O
Centronics Parallel Port
Complete with Power Supply
and Enclosure

To order call 213/202-1865
Dealer Inquiries Welcome

16 BITS FOR YOUR TRS-80 WITH MICROMERLIN™

Hardware

- 5MHz 8088
- 16-bit μP
- 8087 co-processor
- 128K - 768K byte RAM
- 2K - 8K EPROM
- Color Graphics

Software

- 8 Vectored Interrupts
- 3 Programmable Timers
- RS232C Serial I/O
- Centronics Printer Port
- CP/M 86
- MS-DOS
- IBM PC, TI Diskette Format
- File Transfer Utilities

Watch for Upcoming Products

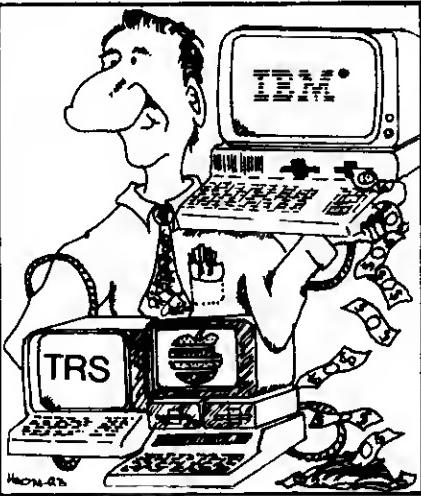
RAM Disk Option
Multitasking O.S.

Available for TRS-80
Models I, III, 4
LNU Model I

MICRO PROJECTS™
ENGINEERING, INC.

10810 W. WASHINGTON BLVD., SUITE C
CULVER CITY, CA. 90230

MicroMerlin is a registered trademark of Micro Projects Engineering Inc. CP/M and CP/M 86 are registered trademarks of Digital Research Inc. IBM PC is a registered trademark of IBM. MS-DOS is a registered trademark of Microsoft Inc. TRS-80 and TRSDOS are registered trademarks of the Tandy Corporation. LNU is a registered trademark of LNU Research.



FILE TRANSFER PROGRAMS

TRS → IBM PC or XT
APPLE → IBM PC or XT

Transfer your TRS Model I, II, III, 4, 12 or 16 files to the IBM PC or XT.

Transfer your Apple II, II+, or IIe files to the IBM PC or XT.

- No more retyping or wasted time
- Fast transfer-baud rates of 110-9600
- File concatenation supported
- Send files of any length
- Make \$\$\$ - the IBM PC is new and software is scarce-take your "new" programs and sell them for \$\$\$.
- Transfer ASCII files, random files, text files, data files, binary files, high level language programs (Basic, Pascal, Fortran, Cobol, etc.), electronic spread sheet data, word processor files, etc.; it all gets transferred!

The File Transfer Program comes complete with all instructions, hardware and software (for both machines).

FILE TRANSFER PROGRAM diskette

(Works with IBM DOS 1.1 or 2.0)

APPLE **\$94.95**

TRS **\$89.95**

(State TRS model when ordering)

Plus \$2.00 shipping & handling

(CA residents add 6.5% State sales tax)



MC/VISA/COD/CHECK OK



Phone orders call
(408) 988-0164

**PERSONAL
COMPUTER
PRODUCTS** 176

1400 Coleman Avenue, Suite C-18.
Santa Clara, California 95050

IBM is a registered trademark of International Business Machine Corp.
Apple II, II+, and IIe are registered trademarks of Apple Computer Inc.

Program Cross Reference, Mortgage Calculations, and much more. Contact their office for further program information and pricing.

ELTECH ASSOCIATES

2466 Moreno Drive
Los Angeles, CA 90039
213-663-0347

MANUFACTURING CONTROL SYSTEMS (Models II, III, and 16)

A labor reporting/performance system that monitors and measures the efforts of your work force. It provides you with the daily, weekly, and monthly information you need to control your costs. You can trace each employee's work efforts, each department's performance, and all production-job labor costs. In addition, you can monitor indirect labor charges on your expense accounts with weekly and monthly reports. The system handles 400 employees, 500 production jobs, and 200 departments or work centers. The Model III version sells for \$345, and the Model II/16 version for \$445.

Eltech makes nine other business programs, including Shop Order Control, Purchase Order Control, Manufacturing Job Cost Control, Inventory Control, Bill of Materials Processor, Production Planning Control, Material Planning Control, and others. Contact Eltech for further information concerning product descriptions, pricing, and Radio Shack compatibility.

EXECUTIVE SOFTWARE INC.

255 Delaware Ave.
Buffalo, NY 14202
705-722-3373

DECISION ANALYST

(CP/M Operating System Required)

A program package that helps businessmen analyze complex business problems where many alternatives and/or criteria exist. It takes the user through eight menu-selected sections that include problem definition, statement of decision purpose, establishing and valuing must and want criteria, calculation of criteria values, defining alternatives, weighing and scoring alternatives against criteria, assessing possible adverse consequences, and final conclusions. This program is offered at \$139, and it is recommended that the user have access to an 80-column printer.

G&G CUNNINGHAM, CPAs

610 Park Blvd.
Austin, TX 78751
512-458-5760

G&G GL (Model II)

A general ledger program written by a certified public accountant for accounting practices with numerous client records. The program supports as many as nine departments. Printouts are available for each department, all departmental information, or summary information only for all departments. The chart of accounts for a particular installation and the number of transactions between closings are both unlimited, subject to the user's disk space. The program prints standard transmittal letters to accompany prepared financial statements. This package costs \$495 and comes with a 30-day refund if you are not satisfied.

G&G 1040 (Model II) (64K)

A tax preparation package that accepts IRS-supplied forms as input sheets. It supports 27 IRS forms and the results of all calculations are carried to other forms as appropriate. Where computations are necessary to choose the least-tax alternative, the program selects and computes the result with the lowest tax rate. A variety of print options are available, and you can easily recompute and reprint your entire return in fewer than 15 seconds. The Professional Series costs \$750, and the Starter Series (11 schedules, and no depreciation or batch options) sells for \$195.

GOOD SOFTWARE CORP.

12900 Preston Road
Dallas, TX 75230
214-239-6085

INVESTOR III

(Models II, III, 12, and 16) (64K)

Allows you to quickly evaluate real estate investments. Calculate up to 20 years of projections based on depreciation tax shelter, future property values, mortgage balances, capital gains and recapture taxes, net proceeds from resale, return on equity, and internal rate of return. A sensitivity analysis feature permits rapid change of assumptions and revised projections with output to printer or screen.

The program costs \$249 plus \$5 shipping and handling, and comes with a 30-day warranty. Good Software also

replaces defective disks at a substantial discount. Demo packages cost \$50 plus \$5 shipping.

GOOTH SOFTWARE
931 South Bemiston
St. Louis, MO 63105

INCOME TAX PROGRAMS

These 70 Tax Programs, including the 1040, 1040A, 1040EZ, all schedules, and most of the forms, sell from December 1 through April 1 of each year. On January 15, the 1120, 1120S, 1041, and 1065 are ready for distribution. Each of these tax programs comes in the Revproc printing format as approved by the IRS. The computer prints the entire form, so there is no need to obtain IRS forms or schedules. Exceptions to this are those forms that the IRS requires in original format. The programs cost \$24.95 per disk. Contact Gooth Software for further information on specific tax programs.

HOLMAN DATA PROCESSING
2059 West Lincoln
Oroville, CA 95965
916-533-5992

GENERAL LEDGER
(Models I, III, and 4)

A large-capacity general ledger system that handles over 400 accounts and 5,000 transactions per month on a two-disk-drive system. You define all headings and spacing, and see all reports in a three-column format. Reports include

Continued from p. 157

TAX

G&G Cunningham, CPAs
Gooth Software
Rockware Data Corp.

OTHER

Blechman Enterprises
Amway Business Programs
Color Software Services
Management Skills Series (Being Boss)
Demi-Software
Project Management Program (Demi-Plan)
Eltech Associates
Labor Analysis and Production Control
Executive Software Inc.
Aid to Problem Solving (Decision Analyst)
Joseph Nichols Publisher
Writer's Professional Submission Register
K.J.K. Management Group Inc.
Service Station Bookkeeping System
Manhattan Software
Amway Business Programs
Rockware Data Corporation
Tax Programs
Software Models
Construction, Real Estate, Home & Finance
Templates
Southwest Systems
Aircraft Maintenance Program
Taranto & Associates Inc.
Sales Analysis
The Software Terminal
Life Insurance Management System
Univair International
Medical, Dental & Insurance Programs
VolksMicro Computer Systems Inc.
Smart Terminal Program (Commwhiz)
XYZT Computer Dimensions Inc.
New Interactive Computing Environment
(NICE)



Hwy 11 South, Trenton, GA
1-404-657-5114

RADID SHACK:
(All equip is 100% pure RS)

Model 100, 8k ram	\$ 650
Model 12, 1-drive	\$2699
Model 12, 2-drive	\$3399
Model 4, 64k, 2-dr	\$1699
12 meq hard drive —	
■ This Month's Special!	\$2899
DMP-2100 printer w/cable	\$1799
DMP-210 printer	
w/cable new new new	\$ 750
All Radio Shack Software 10% Off	

Call for other
LOW, LOW RS prices not listed.

Miscellaneous

All Eagles list come with "Spellbinder", "Ultracalc", CP/M & CBasic.	
Eagle IIE, 2-drive w/390k per drive	\$1995
Eagle IIE, 2-drive w/780k per drive	\$2999
Eagle IVE, 780k floppy, 10 meg hard	\$3999
Complete line of Eagle — Call for others —	
Televideo 803, 64k, 2-drive	\$2495
ProWriter 8510 printer w/cable	\$ 450
ProWriter 1550 printer w/cable	\$ 799
Okidata ML-92P printer w/cable	\$ 599
Okidata ML-80P printer w/cable	\$ 399
Okidata ML-82PS printer w/cable	\$ 499
64k CoCo ram, set of 8	\$ 79
SuperPro keyboard	\$ 69
FHL Flex system	\$ 69
CoCo Drive #0 (Tandon) w/controller	\$ 449
80x 10 Verbatim 5 1/4" diskettes	\$ 29
Box 10 Verbatim 8" diskettes	\$ 49
5 1/4" flip file, holds 50	\$ 25
8" flip file, holds 50	\$ 35
5 1/4" flip-pak, holds 10	\$ 5
8" flip-pak, holds 10	\$ 6
Disk drive head cleaner kit	\$ 12
9 1/2" x 11" paper, 1250 shts, disaperf	\$ 29
14 1/2" x 11" green bar, 1500 shts	\$ 33
ProWriter Ribbons	\$ 7
J-Cat Direct Connect Modem	\$ 125

Complete line of accessories —
CALL, CALL, CALL

(Prices subject to change.)

We accept American Express, VISA, MasterCard
(Add 3% to total).

**Return this coupon with \$1.00
& receive a Head Cleaner Kit!**

(\$12.50 value—5 1/4" drive only)

Name _____

Address _____

City, State, Zip _____



Hwy 11 South, Trenton, GA
1-404-657-5114



Executive Software's answer to business problem solving: Decision Analyst.

Balance Sheet, Statement of Changes in Financial Position, and Income Statement. Transactions can be entered, edited, and listed. You can even exit without posting. A test set (\$50) lets you check the suitability to your business. The complete system is priced at \$149.95.

ACCOUNTS RECEIVABLE (Models I, III, and 4)

Handles up to 5,000 customers and 15,000 transactions. The program has a balance-forward system, and is capable of entering and posting 120 invoices per hour. You can add a customer in 30 seconds without having to sort the customer file. Reports include aging, copy of statements, labels, late charges, posting audit trail, and so on. A test set limited to 15 accounts sells for \$50. The complete system is priced at \$149.95. The General Ledger program is only \$50 if you order it with Accounts Receivable.

HOWARD W. SAMS & CO. INC. 4300 West 62nd St. Indianapolis, IN 46268 317-298-5419

MIND TOOLS (Model II) (VisiCalc)

This program temporarily interlocks with the VisiCalc spreadsheet so you can immediately perform 17 common financial planning calculations. Mind Tools allows you to calculate present, net present, and future values; yields; internal and financial management rates of return; and basic statistics. It also allows break-even analyses, depreciation schedules, and amortization tables. This system costs \$69.95, and comes with complete documentation, including 128-page user's manual and a 40-page quick-reference guide.

MAGNUM (Model III) (48K)

A powerful data management system that lets you create, store, search out, sort, edit, display, and print records in data files up to 1,200 records long. You can search 10 ways for up to eight items in one or all fields, and display or print the results in record-order or sort on up to three fields. Magnum prints any of four predefined columnar reports on any of three mailing-label formats and prints on up to six different forms, such as checks and invoices. This software package sells for \$79.95. An 80-column printer is recommended.

HOWE SOFTWARE 14 Lexington Road New City, NY 1056 914-634-1821

SMALL BUSINESS ACCOUNTING (Models I, II, and III)

Keeps track of income, expenditures, and payroll for a small business. Enter income and expenditures on a daily, weekly, or monthly basis. The program computes monthly, through last month, and year-to-date summaries. The payroll section, not included in the cassette version, records individual employees and their paychecks with up to six categories of payroll deductions. The disk version sells for \$59.95, the cassette version for \$29.95, and the Model II version for \$69.95.

MAILING LIST (Models I, II, and III) (48K)

Maintains mailing lists of up to 1,328 names. Commands allow adding, changing, deleting, and finding names. The program sorts by machine language, according to the data in any field (name, address, and zip code). Labels are printed in up to four columns in master list or on video display. Tabs adjust to fit any size labels. The program is available only on disk. The Model I/III version costs \$69.95; the Model II version is \$79.95.

IN-MEMORY DATA-BASE MANAGEMENT (Models I, II, and III)

Defines files of various descriptions and maintains them on either cassette or disk. An in-memory system, the program allows files of up to 50 fields, with the number of records available determined by RAM space. Commands include add, change, or delete records; find a specific item; sort according to the data in any field; print file on display or printer; save file on cassette or disk; and total items in a single field with or without comparison. Reports are formatted in several ways. The cassette version costs \$29.95, the disk version \$34.95, and the Model II version \$49.95.

SMALL BUSINESS MANAGEMENT SYSTEM (Models I, II, and III)

Contains everything you need to manage a small business. The software includes Order Desk, to enter orders and print invoices and mailing labels;

Bookkeeping, a complete general ledger; Inventory, summarizes all products sold by product type and price charged; and Customization, a complete installation package for each business to tailor the program to its own requirements. Before you buy this system, check its capabilities and limitations. The Model I/III version sells for \$350, the Model II version for \$400.

JOSEPH NICHOLS PUBLISHER P.O. Box 2394 Tulsa, OK 74101 918-583-3390

WRITER'S PROFESSIONAL SUBMISSION REGISTER (Model III) (48K)

A menu-driven program that lets the writer record each submission by manuscript title, publisher or magazine, address of publisher or magazine, date of submission, and identification of the literary form. An update feature provides the date of acceptance or rejection, and a comment line for recording money received or editorial remarks.

The program displays or prints the current submission of a manuscript, all the places the script was submitted, all manuscripts sent to a particular publisher or magazine, a list of all the submissions in a particular literary form, and a listing of the complete register. The disks hold approximately 150 manuscript title records, 2,500 submission records, and 300 addresses. The Register sells for \$59.95 on two disks written in Cobol.

K.J.K. MANAGEMENT GROUP INC. Systems Division 546 Columbian St. Weymouth, MA 02190 800-323-5511

GAS-PRO (Model III)

A comprehensive bookkeeping system developed specifically for service stations. It permits shift-by-shift checkout of the day's gas and repair sales, accumulating to a one-page sales summary with a detailed statistical analysis of gas sales. Gas-Pro maintains accounts receivable, prints customer statements, tracks accounts payable, details invoices for payment, provides a daily breakdown of parts and labor into 20 user-defined categories, and it tracks mechanic's sales and commissions

weekly or monthly.

It is available from K.J.K. for \$6,800, including hardware, software, disks, in-house instruction on system use, and free system updates for one year.

LIZCON TRADING
2949 South 3rd West St.
Salt Lake City, UT 84116
801-484-8179

A/R-STATEMENT OF ACCOUNT
(Models I, II, and III)

Print the following: statement of account, statement of commission, accounts receivable ledger, accounts receivable aging, price list by product class, alphabetical listing of customers, mailing labels, and alphabetical listing of vendors. The random-access method creates all data files and speeds data update and retrieval. The Model I/III version costs \$199, and the Model II version \$289.

INVOICING-INVENTORY PROGRAM (Models I, II, and III)

Lets you update quantity-on-hand in the inventory file while printing the invoice. With the data base, you can print the following: product inventory ledger, price list by product class, alphabetical listing of products, items below reorder level, alphabetical listing of customers, mailing labels, and alphabetical listing of vendors. Model I/III version sells for \$199, and the Model II version for \$289.

MAILING LIST PROGRAM
(Models I, II, and III)

Lets you print mailing labels not only by city, state, and zip code, but also by priority coding. This permits you to selectively print mailing labels according to preference. The Model I and III versions each sell for \$99, and the Model II version sells for \$189.

INVOICING-A/R-VENTORY PROGRAM (Models I, II, and III)

Updates quantity-on-hand in the inventory file while printing the invoice in addition to posting invoice data to the accounts receivable file. You are able to print the following: statement of account, statement of commission, accounts receivable ledger, accounts receivable aging, product inventory ledger, price list by product class, alphabetical listing of products, items

below reorder level, alphabetical listing of customers, mailing labels, and alphabetical listing of vendors. Model I/III version costs \$399, and the Model II version costs \$499.

VIDEO TAPE RENTAL SOFTWARE (Model III)

Allows you to print sales receipts and interact with customer and inventory files. You can quickly track down a rented item by entering its inventory number; the screen shows the name of the renting customer and the date rented or returned. The program is priced at \$399.

MANAGEMENT SERVICES
2901 Clendenen Lane
Longview, TX 75601
214-757-4558

MARKET MASTER
(Models I, II, and III) (48K)

Market Master, a stock and commodity market analysis tool that creates and maintains large price data files, tests a trading system in various markets, graphs prices and results of a trading system, provides daily buy/sell recommendations, and provides printouts in any report mode. Nine versions of this system are available, each containing one of the following unique trading systems: Dual Moving Average, Percentage Band, Channel, Oscillator, Delay Oscillator, Delayed Channel, Linear Regression System, Composite Index, and Exponential Internal Index. Each version of Market Master sells for \$124.95. If you want to purchase the complete set, the company recommends that you buy the Magnum series for \$595 on the Model I/III and \$695 on the Model II. The Magnum series is a more powerful version of the Market Master system.

Market Master is just one of several stock programs put out by Management Systems. A sampling of programs includes Datamax, Comdata Package, MJK Package, Analyst II, Data Files, and the Magnum System.

MANHATTAN SOFTWARE
P.O. Box 1063
Woodland Hills, CA 91365
213-453-6943

AMWAY BUSINESS MANAGER
(Models I and III)

An interactive, three-part program,

PASCAL

\$ 14.77!

Now you can try Pascal without spending a fortune! The Pascal 80 Trial Version is a reduced version of Pascal 80, and does not include pointer variables or disk files, and does not allow you to save your programs. But it does let you program in Pascal, list your programs to a printer, and even comes with a coupon worth \$10 off the regular price of Pascal 80. This version of Pascal comes on a diskette that will boot on a Model I or Model III TRS-80.

Here is what you get:

VARIABLE TYPES: real, integer, char, boolean, arrays, sets, records, and user defined types.

CONSTANTS: minint, pi, true, false, and user defined constants.

OPERATORS: + - * / div mod comparison/set operators and or not.

FUNCTIONS: abs sqr sqrt sin cos arctan exp ln ord pred succ chr odd round trunc.

PROCEDURES: read readln write writeln

STRUCTURES: if..then..else case for..do while..do repeat..until goto

Send \$14.77 by check or money order to:

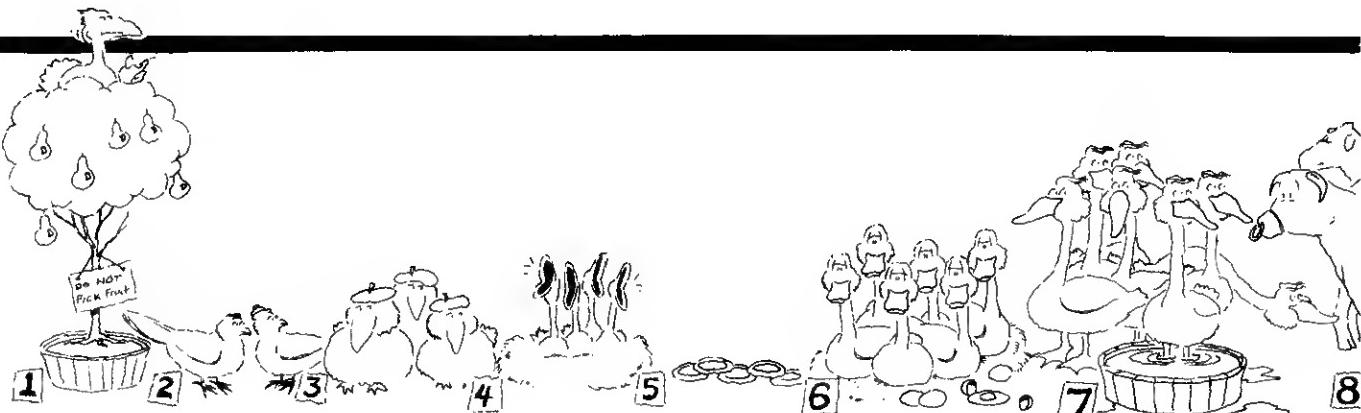
Pascal 80 Trial Version
New Classics Software
239 Fox Hill Road
Denville, NJ 07834

Sorry, no credit card orders at this price! See our other ad for information on our regular version of Pascal 80.

NEW CLASSICS
SOFTWARE

v255

Continued on p. 164



Stretch the Twelve Days of

Give a gift subscription to **80 Micro** today and relax . . . you can't find a better gift for active computerists. Every issue gathers together the latest programs and projects for Radio Shack's personal computers, business computers, and portables. Your favorite computerist will be busy year round with:

Powerful Utilities—save time and effort and do more computing than ever before. Recent issues have included ways to improve Electric Pencil*, a program-to-program data transfer, and a cassette operating system.

Programming Techniques—learn how to program and spend less on software. Pick up a second language for special applications. Get faster results with machine-language subroutines . . . the monthly column "The Next Step" shows how.

Hi-res Graphics—make better business presentations with fancy printouts. Illustrate games with eye-catching details. Create unique 3-D art. It's all possible with articles on advanced graphics techniques.

Business Applications—increase office efficiency. Learn the business models' different capabilities. And keep abreast of developments for the Model 100* with reviews, applications, and utilities in "C•Notes."

Exciting Games—enjoy arcade games, adventure games, and simulations. Use the program listings to add features to other games. Or record high scores in "The Gamer's Cafe."

Two-way Communication—get definitive answers to technical questions in "Feedback Loop." Respond to articles, editorials, and news with "input." Or submit an article for publication. **80 Micro** is a forum for ideas, not a one-way street.

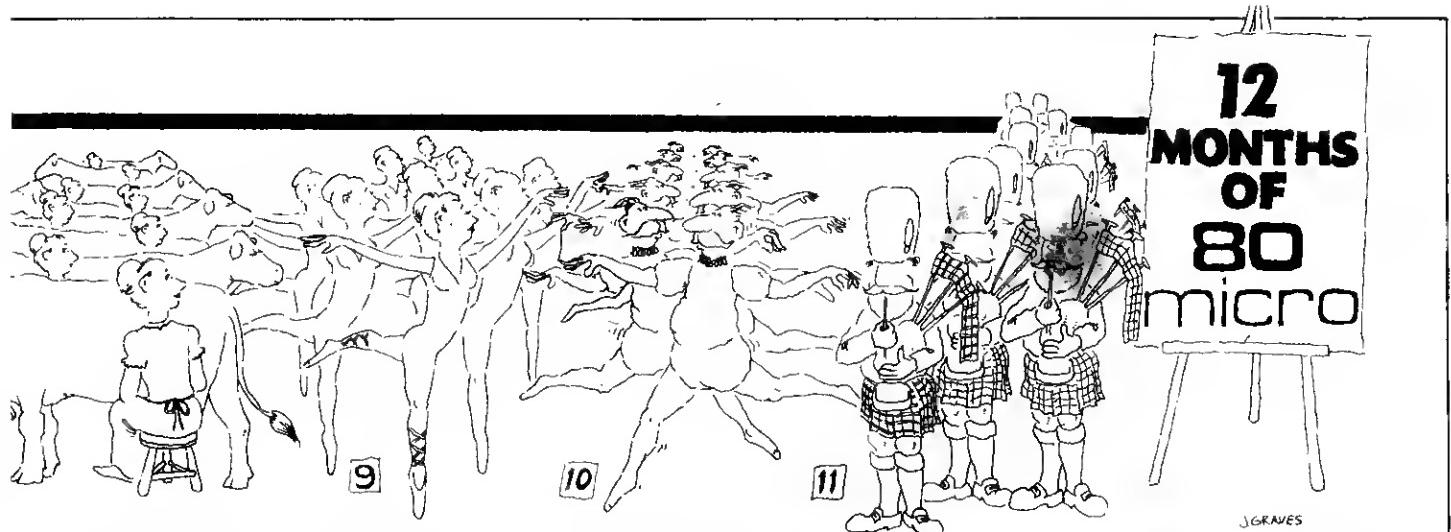
"News" & "Remarks"—discover the latest industry trends and how they'll affect consumers. Learn about new services or novel applications. And get the inside story with publisher Wayne Green's outspoken editorials.

Home and Hobby—break the ice at a party with a singing computer. Or make electronics projects easier with a circuit-board scanner. Whatever the subject, there's always something of use in **80 Micro**.

Buyer's Guides—comparison-shop from home and save hundreds of dollars. Get all the facts on graphics software, printers, utilities, disk drives & disks, and more.

Candid Reviews—use "Reviews" and "Review Digest" to find out a product's strengths and weaknesses before it leaves the store.

80 micro
the magazine for TRS-80® users



Christmas into Twelve Months

Know all about the latest releases with "New Products." Now every purchase can be a sound investment.

Hardware Projects—get quality equipment and hours of fun in the shop. Build a Model II* capacitance meter. Diagnose acoustic couplers. Or repair digital circuits. Customize any system to meet specific needs.

In-depth Series—become a local expert in any field. Learn computer cryptology, or how to use data files. Give the Model I/III* color capability. Discover APL, Assembly, Lisp... and more.

Give a gift subscription to **80 Micro** today and relax. Why hassle with holiday crowds and pushy salesmen when you can avoid the last-minute rush? Christmas shopping has never been easier.

Just fill out the coupon or the attached card and return it now to **80 Micro** Subscription Department, P.O. Box 981, Farmingdale NY 11737. A full-year subscription is only \$35.97. That's a savings of 27% off the newsstand price...and convenient home delivery is FREE.

Give **80 Micro**. Your favorite computerist will thank you again and again and again.

Dear Santa, I want to give a year's subscription to **80 MICRO** for the Holidays (12 issues for \$35.97).

Check enclosed
 MC VISA AE BILL ME

CARD # _____

Expire Date _____

Signature _____

My Name _____

Address _____

City _____ State _____ Zip _____

Please enter a one year gift subscription to:

Name _____

Address _____

City _____ State _____ Zip _____

U.S. \$35.97, 1 year only.
 Canada & Mexico \$44.97, 1 year only U.S. funds drawn on U.S. bank.
 Foreign Surface \$54.97, 1 year only U.S. funds drawn on U.S. bank.
 Foreign airmail please inquire.

All gift subscriptions begin with January 1984 issue.

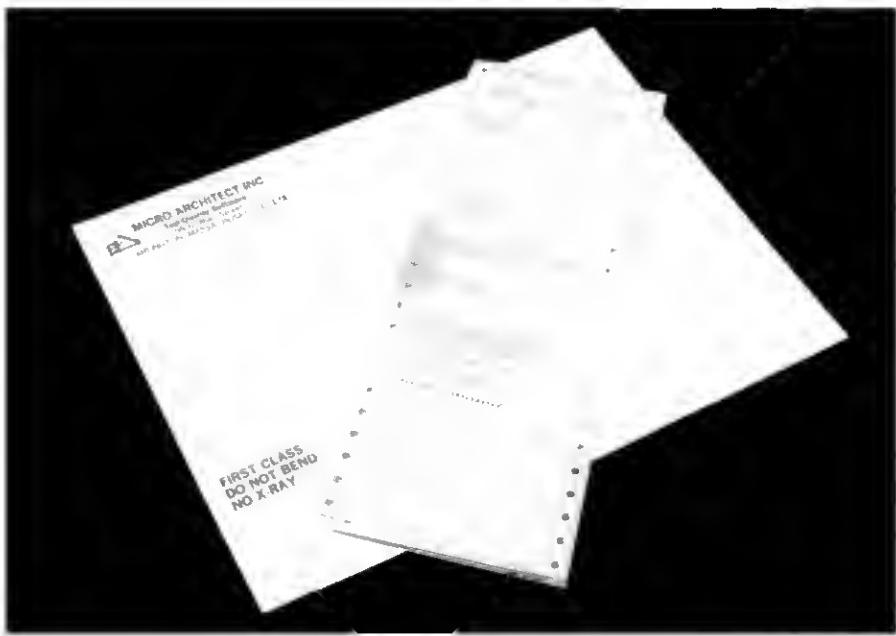
80micro
the magazine for TRS 80 users

PO Box 981
Farmingdale, NY 11737

639BB

* Electric Pencil is a registered trademark of Michael Shrayer.
 * TRS-80, Model-100, Model II, and Model I/III are registered trademarks of Radio Shack, a division of Tandy Corp.





Micro Architect's Mail-X program prints labels, and accesses over 32,000 records in one file.

Continued from p. 161

this software package controls inventory, verifies incoming SA-I orders, and compiles PV and BV for personal orders. The program provides inventory initialization, restocking, and non-order withdrawal. Any product can be checked on the display at any time, and the data updated or edited as necessary. A random-access disk file provides full information on 450 products, including stock number, name, PV, BV, and wholesale and resale costs. The program also accommodates detailed information on 200 distributors. Reports provide Inventory Status, Sales, Product Records, Reorder Needs, and Distributor Records. The program is supplied with a 50-page manual and comes with demonstration figures in several of the files. It sells for \$149.95.

THE AMWAY COMPANION (Models I and III)

A supplementary program that interacts with the indexes and files of the Amway Business Manager package to provide the following features: automatic printing of a single-page or multi-page SA-2R RDC order, with all information placed in the appropriate spaces of the order lines; order information inserted from the reorder file of the Business Manager program into the Companion program with a month-to-date total of PV and BV feature; product rearrangement and product updates; on-screen scrolling of all product records; and page-formatted printouts of Product Records, Inventory Status, and Sales with page heading and num-

bering. The program costs \$49.95 and requires a friction-feed printer if you want SA-2Rs single-sheet printed.

AMWAY BONUS MANAGER (Models I and III)

Another supplementary program for the Business Manager software package. This program provides the following capabilities: printed reports on downline groups and families, on-screen and printed reports on upline relationships of any distributor in the Business Manager's files, calculation of bonuses due to each distributor, editing feature to update any distributor's record filed with the Business Manager, and added transfers and other bonus information for a complete record of bonuses receivable and payable at any level. This supplementary package sells for \$99.95.

MICRO ARCHITECT INC. 96 Dothan St. Arlington, MA 02174 617-643-4713

INV-V (Models I and III) (32K)

An advanced inventory management and control system that consists of an initialization, data-base manager, and report manager modules. The inventory item is randomly accessed by a nine-digit alphanumeric key. Reports give you order information, performance, and formatted dump of your data base. This system key-random accesses over

1,000 items (2,400 on a Model III), and has the following features: screen input, order entry, shell sort, and a powerful report writer. This program sells for \$89; for an additional \$10 you receive an optional data disk.

Micro Architect manufactures over 30 other business programs for the Models I/III and Model II computers. A small sampling includes a cassette data base, stock security information system, sorting utility, sale analysis, mailing list system, accounts receivable, general ledger, payroll, accounts payable, and so on.

MICRO 80 INC.
2665 North Busby Road
Oak Harbor, WA 98277
800-528-6050 (Orders only)
206-675-6143 (Inquiries)

MANAGEMENT SYSTEM II (Models I and III)

A cassette-based file management program executing all commands by single-letter entry. File presentation is a maximum of two horizontal lines (100-plus characters) with one to nine vertical columns. Column titles are easily created, and files may be added, updated, listed, deleted, or saved to either tape or printer. Special features include a machine-language sort of any column you choose and a total function for adding integers in any column. There is also a Labels command that lets you produce mailing labels, file labels, and so forth. The cassette is priced at \$26.95.

MICRO-ORGANIZER I (Models I and III)

A three-program set that itemizes expenditures by the day, week, month, or year. You can analyze necessities, scrutinize non-essentials, and review wasteful spending habits. It comes with a claims adjuster program so you can conduct an accurate inventory of your possessions and account for your untold assets. The system also features Schedulizer, an up-to-date appointment calendar. This program is available on both tape and disk at \$19.95.

MICRO-ORGANIZER II (Models I and III)

A three-program set capable of creating and manipulating name and address files. Comes with Comparison Shopper, a comprehensive cross-reference system that identifies and com-

Which TRS-80* Accounting Software Do I Buy . . .

That's a tough question. I know, I asked it myself not very long ago. I'm Mike Motta. As president of Shawmut Systems, specialists in TRS-80* custom software, my customers were asking me for Model II and 16 Accounting Software — GL, AR, AP and Payroll. But I said "Why write the software. There must be a good package already available." So I searched for the best I could find. And I found it!

Now, when I tell you that these are the best Accounting programs I've seen on a microcomputer, you probably think that you are just listening to another sales pitch. But you're not. You're listening to a businessman with over twenty years combined experience in sales, management, and programming. So when I say that these programs will work for you, it really means something.

Each program, designed for the Model II or 16, will work with one or more floppy or hard disks. With each program, I'll include a 200 page manual written with the first time user in mind, and a set of sample data files so you can start using the program right away.

But I won't stop there. If you have a question, or a problem, call me. You won't get an operator, or order taker. You'll get me. And if I can't talk to you on the spot, I'll call you back. And I'll fix your problem. FAST.

Now I could say a lot more about these programs, but you really won't know how good they are until you try them. So, order the programs you need, and try them for 14 days. If you're not convinced that these are the programs for you, send them back, and I'll refund your money.

My price for these programs is only \$289.00 each, postpaid. I could charge hundreds more, but I want you to have the best programs at the best possible price. So mail or call your order in today. I'll make sure you'll be satisfied.

Model II/16 Accounting Software Packages

Accounts Receivable	\$289	Accounts Payable	\$289
General Ledger	\$289	Payroll	\$289

SHAWMUT SYSTEMS
105 Circle Drive • PO Box 324-A
Somerset, MA 02726
(617) 672-9794

Ask about our Model I and III versions.

Send check, money order or
Visa/MC number

*TRS-80 is a Trademark
of Tandy Corp.

Mass. residents add
5% sales tax.

✓ 363

FREE business software directory

- Radio Shack's Model I, II, III.
- Heath's MBASIC and HDOS
- CPM: Xerox, Alto...
- IBM Personal Computer

"IDM2 is GREAT!"

- publisher of 80-US

"(GL) superior to either the Osborne (SBSG & Taranto) or Radio Shack... MAIL-X has a greater capacity... more flexible than (R.S.)"

- columnist of 80-microcomputing

"imperceptively fast...(DBMS) is a good and reliable workhorse"

- publisher of Interface Age

Data base manager, integrated accounting package (AR, AP, GL & Payroll), inventory, word processing, and mailing list. Compare and be selective !



Micro Architect, Inc.
6 Great Pines Ave., Burlington, Ma 01803

✓ 149

compu-sette®

TAPES & DISKS

100% ERROR-FREE
FULLY GUARANTEED



**C-10's
39¢ ea.**
(min. lot of 500)
w/ labels add 4¢
w/ boxes add 13¢

The Micro-Trac™ Generation

Used by Software Firms & Computer Hobbyists
Choice of School Districts Nationwide

CASSETTES	MINI	STANDARD
	12-PAK	24-PAK
C-05.....	\$.79	\$.59
C-10.....	\$.99	\$.69
C-20.....	\$.99	\$.89
C-30.....	\$ 1.29	\$ 1.09
Custom Cases.....	\$.25	\$.21

Cases recommended to protect sensitive cassettes

5 1/4" DISKETTES	MINI	STANDARD
	5-PAK	10-PAK*
Soft Sector Single Sided S/D Density...	\$14.95	\$26.95

*10 PAK w/custom library case, add \$3.00

— UPS SHIPPING —

(No. P.O. Boxes please)

\$3.00 per pack

— Canadian shipping multiply by 2 —

No. 1 Magnetic Media in the USA!

— Write for volume prices —



TOLL-FREE
(orders only)
1-800-528-8050
ext. 3005
In Arizona State
1-800-352-0458
ext. 3005



MICRO-80™ INC.

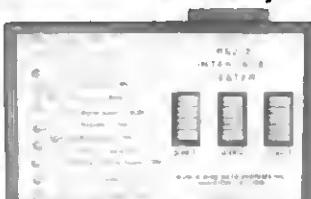
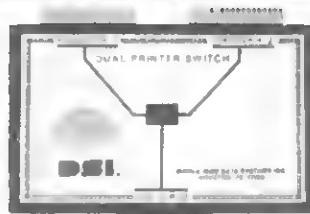
E. 2665 Busby Road
Oak Harbor, WA 98277
1 (206) 675-6143

80 Micro, September 1983 • 165

COMPUTEX

div. of World Wide Data Systems Inc.

NEW TOLL FREE NUMBER.....Technical and calls within Texas --[713]488-8022

1-800-231-0566**Assembled**
\$89.95**Kit**
\$69.95**Dual
Printer
Switch****\$29.95****Assembled & Tested**

The Dual Printer Switch from Computex can be used in one of two ways: (1) Connect two printers to one computer -or- (2) Connect two computers to one printer. Works with MOD I, II, & IV. Six inch cable from computer to printer switch is \$9.95. IBM P.C. model also available. Call for info...

All kits include printed circuit board, manual and all components required to make boards functional. Mounting kits, cases and cables may be extra - Call for details on the kit you want. We also carry individual parts and kits for other Micro Design and LNW boards and systems.

MOD III / IV Disk Drive Kit's

No other drive controller provides the features and reliability that the Trilogy controller does. Designed around Western Digital's WD2793 controller chip, the Trilogy controller provides automatic Phase Lock Loop Data Separation and Write Precompensation, Gold Plated Edge Card Connections, Single - Double & Quad Density, and 5in. and/or 8in. disk drives.

Trilogy Controller (Assembled) \$129.95
Installation Kit (Mod III / IV) \$99.95

**TANDON DRIVE'S**

		With Trilogy	Bare Drive	With PS & C
TM100-1	SS-40T	\$170	\$180	\$230
TM100-2	DS-40T	\$230	\$240	\$290
TM101-4	DS-80T	\$290	\$300	\$350
TM848-1	SS-8 Inch	\$380	\$400	\$550
TM848-2	DS-8 Inch	\$470	\$500	\$850
SA455	DS-40T H.H.	\$240	\$250	\$Cell

Other drives and accessories available - Call for Info..

We Won't Let You Fail

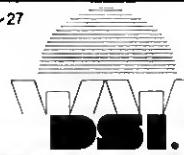
If for any reason you are unable to complete the assembly or installation of any kits purchased through Computex, Simply return the kit postpaid along with a check for the difference in price between kit and assembled - We will finish assembly of the board and return to you your kit in full working condition.

ORDERING INFORMATION

VISA, M.C. and American Express accepted. Prices shown are good through cover month - However, prices are constantly changing [Usually decreasing] - so call first! All orders over \$1000 shipped free UPS Ground, all others call for rates.

Call for prices on 64K & 16K Ram, 27 Diskettes, Printers, & Modems.

New Fall Catalog Ready -- Call!

**15502 Highway 3 Suite 112
Webster, TX 77598**

relation entry, and provides three estimates of communalities: units, absolute maximum row, and squared multiple correlations. Priced at \$95.

DISCRIMINANT FUNCTION: For up to 58 variables. Discriminant function coefficients, F-ratio, cutoff point, and z-score cutoff points. Dichotomous groups. Available for \$70.

STEPWISE MULTIPLE REGRESSION: For up to 61 variables. Each step output includes regression coefficients, regression and residuals tables, multiple correlation coefficient, standard error, F-ratio, means, standard deviations, intercorrelations, and so on. Printed listings of residuals for each observation. Priced at \$120.

MATRIX MANIPULATION: Outputs the addition, subtraction, multiplication, inversion, and transposition of matrices of up to 40 rows or columns. Menu-driven, and provides for the solution of a system of equations of up to an order of 40. Sells for \$45.

ROCKWARE DATA CORPORATION
P.O. Box 365
Plano, TX 75240
214-596-0588

SUPERTAX I
(Models I, II, III, and 16)

Generates summaries of pages 1, 2, and Schedule A of Form 1040. It also prints an overall summary of the return showing Adjusted Gross Income, Itemized Deductions, Taxable Income, Regular Tax, Income Averaging Tax, both Minimum taxes, and Payment Due or Refund. This program also calculates the moving expense deduction, investment credit, taxable gains, political and child care credits, medical limitations, and more. The program is tax deductible and costs \$24. Subsequent year updates are subject to a 20 percent discount.

SUPERTAX II
(Models I, II, III, and 16)

This package includes the above Supertax I program as well as the more detailed Supertax II program that performs all of the Supertax I calculations and prints the income tax return. It prints page 1, page 2, and Schedules A, B, and G of the 1040 tax form and the 3468 form using the tractor-feed income tax forms supplied with the program. It sells for \$31.50.

SUPERTAX III
(Models I, II, III, and 16)

Includes both the Supertax I and Supertax II packages plus a program to calculate and print Schedule C of the 1040 form. Also included is a stand-alone depreciation program that calculates and prints your depreciation schedule using both the old rules and the newer ACRS rules. Output from the depreciation program serves as a supplement to IRS Form 4562. This program package sells for \$36.50. Eight-inch disks are \$2 above the listed price for each of the Supertax programs.

SHAWMUT SYSTEMS
P.O. Box 324
Somerset, MA 02726
617-672-9794

ACCOUNTS RECEIVABLE
(Models I, II, III, 4, 12, and 16)

A complete invoicing and monthly statement-generating system that keeps track of current and aged accounts receivable. This package maintains a Customer Master File of customer name, address, phone number, type of account, current balance, tax rate, and other useful account status information; and a Transaction file that contains information on each invoice and payment posted to the customer account.

Other features include Summary Aging/Detailed Aging reports, recovery routine for hardware failure, sample data for demonstration, open credit reconciliation procedures, automatic customer billing option, open item or balance forward, and much more. This program interfaces with the General Ledger System to provide automatic monthly journal entries. Pricing for this package is: Models I/III \$139; Model 4 \$189; Models II/12/16 \$289; and Model 16 with Xenix \$489.

PAYROLL
(Models I, II, III, 4, 12, and 16)

Allows a company to prepare periodic payroll for hourly, salaried, and commissioned employees while accumulating relevant tax information. It generates monthly, quarterly, and annual returns that are filed with local, state, and federal governments. It also prepares employee W-2 forms and maintains an up-to-date information reference for each employee. The Payroll System includes tables for federal withholding and FICA, as well as with-

holdings for any state and up to 20 localities for precomputed or user-generated tables. The system automatically produces payroll checks. It interfaces with the General Ledger to provide automatic monthly journal entries. The Payroll System costs the same as the Accounts Receivable System.

GENERAL LEDGER
(Models I, II, III, 4, 12, and 16)

The TCS General Ledger System records financial transactions and related balances; provides accurate and timely statements (balance sheet and income statement) that describe your current financial position; and provides you with comparative data on your financial position one year prior. The program operates a master file with a Chart of Accounts listing the current balance of each account as well as the year-to-date, budgetary, and previous year amounts; and a Transaction File listing transactions for each accounting period.

A Trial Balance program matches accounts in the master file with appropriate transaction entries from the Transaction File at the end of each accounting period. It provides level totals, lists each account and its transactions, and then updates the master file to produce a current-month master file. Statements produced include a balance sheet, an income statement, and a department-income statement. The General Ledger System costs the same as the Shawmut Accounts Receivable program.

ACCOUNTS PAYABLE
(Models I, II, III, 4, 12, and 16)

Keeps track of current and aged accounts payable. You get programs to maintain a complete record for each vendor; help determine which vouchers to pay by due date, discount date, or within certain cash requirements; and a program to automatically print checks and a check register. Invoices enter into the system through the Enter Vouchers Program and contain information on invoice date and amount, discount date and terms, and due date and terms.

Reports generated by this program include Open Voucher Report, Cash Requirements Report, and Aged Payables Report. The system prints checks for each vendor, and lists all vouchers paid by this check. In addition, there is an End-of-Period Processing Program that accumulates the debit and credit transactions passed to the user's general ledger, and prints out a transaction register with this data. The pricing

Business Software For The COLOR COMPUTER and the TRS-80 Model III

Data Base Manager

Part I	\$99.00
Part II*	\$99.00
Church Contributions	\$99.00
Balanced Billing System	\$99.00
Single Entry General Ledger	\$95.00

Integrated Business Software*

*available for Color Computer only	
Accounts Receivable	\$295.00
Accounts Payable	\$295.00
General Ledger	\$295.00
Inventory 2	\$295.00
Payroll	\$295.00
64K memory upgrade including installation	\$125.00



Call or Write for free catalogue

2457 Wehrle Dr., D-80, Buffalo, NY 14221

PHONE (716) 631-3011

Dealer Inquires Welcome

✓417

FLURP™

Mainframe Accuracy with a Micro

If you need a multilinear regression package with the accuracy of a number-cruncher, you need FLURP (Flynn Laboratory's Ultimate Regression Package). FLURP has easy data input, disk file archiving, and outputs a complete set of statistics. These include: multicollinearity diagnostics, hypothesis testing, an analysis and plot of the residuals, and more. FLURP is available for 8" CP/M (requires MBASIC), TRS-80 I and III, and soon for the IBM PC.

- My \$99.95 is enclosed rush me FLURP (add \$5.00 for foreign shipping)
- Enclosed is \$29.95 for the manual (credit to the purchase of FLURP)
- Bill company (include purchase order)
- Charge my Visa MasterCard

Card Number _____ Expires _____

Name _____

Address _____

City _____ State _____ Zip _____

Signature (credit card orders) _____

Mail to: LEDS Publishing Co., Inc., PO Box 12847, Research Triangle Park, NC 27709 (919) 477-3690.

✓155

Trademarks IBM-IBM Corp. FLURP-LEDS Publishing Co., CP/M-Digital Research, TRS-80-Tandy, MBASIC-Microsoft

INNOVATION QUALITY SUPPORT

PO BOX 204000

1746 North West 55th. Ave. No. 204

LAUDERHILL, FLORIDA 33313

PHONE 1-(305)-739-2071

PIONEER

✓160

SCRIPTR

SCRIPTR makes SCRIPSIT • FULL SYSTEM
Special Custom Versions Support All Popular Printers

MX-80 version allows for Underlining Emphasized, Sub + Super Scripting, Double and ITALICS, MID-LINE even on justified text lines without disturbing the formatting. SCRIPTR supports EVERY programmable feature of the GRAPHTRAX 80 and PLUS roms. No other MOD does as much!

STANDARD FEATURES INCLUDE

PRINT ANY CODE OR STRING OF CODES TO YOUR PRINTER.
WRITE FORM LETTERS BY INSERTING DATE DURING PRINTING.
PRINT ANY PAGE DIRECT WITH CORRECT HEADERS / FOOTERS.
REENTER SCRIPTR TO GET USE OF ALL DOS FUNCTIONS.
SEE WHERE PAGES START AND END WITHOUT PRINTED COPY.
EDIT MODE FOR ERRORS, CHANGES OR GRAPHICS ENTRY.
171 TEACHING PROGRAMS FULLY EXPLAIN EVERY FUNCTION.
66 PAGE MANUAL-BOUND - CASS-DISK Ver. Model I/III for
- CUSTOMERS FOR FOLLOWING -
Centronics 737 + 739 / LP-B + LP-4 - Daisy Wheel II,
Microline 80 + 82A - Prowriter + Cith 8510A + F-10
SCM-TP-1 - DMP-200 + 400 + 410 Gemini 10 + 15 MORE

DOS COMPATIBLE

SYSTEM REQ. TRS-80 MOD I/III, .32K, lower case.
Disk ver. requires SCRIPTR/I/III on both Model's I/III.

PRICE \$40.00 on 15K / Q555 5.5K program.

FREE BROCHURE Demonstrates all features.
Customer support by phone or letter after the sale makes
Scriptr a pleasure to own and use. 1,500 fully satisfied
customers in over 14 countries. CALL OR WRITE FOR INFO.

PLEASE INCLUDE THIS INFORMATION WHEN ORDERING

Name MODEL 1/3 Cass/Disk Printer Type MEM SIZE

CHECKS - MONEY ORDERS - C.O.D'S

CRAYON
DELUXE

FULL SUPPORT FOR: CRAYON DELUXE
MX-80 + 100 + NEW GEMINI 10 + 15
NEC CITH 8510A + NEC 8023A

DON'T LET THIS SIMPLE NAME FOOL YOU CRAYON DELUXE IS
NOT A TOY BUT A COMPLETE WORD/GRAFPHICS PROCESSOR WHICH
OFFERS COMPLETE VERSATILITY IN CREATING CUSTOM LETTER
SETS AND GRAPHICS. WRITTEN IN Z-80 ASSEMBLER, IT IS
FAST, FLEXIBLE AND VERY EASY TO USE. NO PROGRAM OF THIS
KIND WRITTEN IN BASIC CAN COMPARE TO IT. COMPUTING THE
BIT PATTERNS FOR 760,320 BITS PER PAGE OF PRINTING DEPENDS
ON Z-80 ASSEMBLER. COMPARE + YOU WON'T GET G.E.A.PED

STANDARD FEATURES INCLUDE

1. Programmable Underlining, even create lined paper
2. Mix WIDE and regular sizes MID-LINE
3. INVERT any part of the text even MID-LINE
4. SHORT LINE SEEING FOR MAXIMUM SPEED. NO WAITING!!
5. Reversed Block Capitals Character Set
6. FONTMAKER - A 15K Machine Language program
which enables you to create your own custom fonts.
STORE, RETRIEVE AND PRINT letters INSTANTANEOUSLY.
Allows 3 1/2 resident character sets in memory.
PLUS a fast easy way to print sample LETTERS AND SETS
7. Repeat printing capability without carriage advance
even on graphic lines gives Typewriter Quality print.
8. Create 100, or any number of copies of High-Res MAIL
LABELS or LETTERHEADS with easy hands off operation.
9. Complete FORMATTING CONTROLS within the text allow
for multiple page printing without operator control.
10. The sharpest dot matrix print you've ever seen!!
11. Variable DOT LINESPACING control for text documents.
12. Bit Masking allows creation of graphs and the graph
paper simultaneously. Superimpose any background!!
13. CREATE Block Graphics in any size and with every set.
14. Fine Line Drawing for creating real business forms.
15. Character sets may contain letters up to 40H x 127W.
16. Continuous WIDE printing in any font or style.
Even allows for partial EXPANDED from this mode.

FREE BROCHURES

CRAYON - Disk/Cass Mod 1/3 *45 DISK / *35 CASS
CRAYON DELUXE - DISK Mod 1/3 *80.00 / 17 SETS

ADDITIONAL FONTS AVAILABLE

HERITAGE = AMERICAN TEXT + OLD ENGLISH \$15.00

ELITE = 4 Variations on disk for \$15.00

DIGITAL = 3 computer fonts for \$15.00 on disk.

PRINT SAMPLES - AVAILABLE ON REQUEST

CRAYON DELUXE...THE FUTURE IS NOW
WE ARE NOW CARRYING A 5 MEG. HARD DISK SYSTEM FOR THE
TRS-80 MODEL III. PRICE = \$3300 COMPLETE WITH DOSPLUS 4.0
ASSEMBLED - FORMATTED - SYSTEM SEES IT AS 4 DRIVES. CALL
JUST BOOT-UP AND YOU ARE UP AND RUNNING WITH HARD DISK

schedule of the Accounts Receivable program applies to this system as well.

SMALL BUSINESS SYSTEMS GROUP
6 Carlisle Road
Westford, MA 01886-5762
617-692-3800

GENERAL LEDGER
(Models I, II (64K), and III)

Consolidates all financial data from other accounting sources, providing a complete overview of operations and performance. It permits great flexibility in formatting account charts, with user-selected account numbers and descriptions, system size and numbers, and management reports. The program stores 2,500 accounts and 2,250 direct and external postings per month, with all items validated before acceptance. Reports are generated for months, quarters, years, and previous quarters by department or company, and include trial balance, balance sheet, income statement, update, and user-defined reports. This software package costs \$250 on a floppy disk and \$450 on hard disk.

Other SBSG business programs in-

clude Accounts Payable, Accounts Receivable, Payroll, Invoicing, and Inventory. They have a Remote Computer Typesetting, Electronic Mail, Sort, Client Billing, and Communication Systems packages available.

SOFTWARE MODELS
23913 Bowl Road
Box 1029
Crestline, CA 92325
714-338-5075

CONSTRUCTION TEMPLATES
(Models I, II, III, 12, and 16)

A package of construction estimates that cites figures from the "National Construction Estimator" used by all contractors. The programs determine construction costs based on type of land, legal fees, plans, permits, site clearing, and all labor and materials necessary. The program provides you with an accurate estimate so that your bid is neither too high nor too low. Each estimate is independent so you can choose the ones to use. The last template calculates your profit. The program sells for \$59.95 and comes on disk with documentation and a warranty card.

FINANCIAL TEMPLATES
(Models I, II, III, 12, and 16)

These models forecast your sales and finances, and provide you with a complete projection to show bankers and investors. The program includes a break-even analysis, cash budget, means projected, profit/loss, balance sheet statements, ratio analysis, and five depreciation tables and formulas to calculate net present values. Examples come from SBA forms. This program is available for \$59.95.

REAL ESTATE TEMPLATES
(Models I, II, III, 12, and 16)

NIREB Forms B, C, D, G, and I-A provided on disk accomplish the following: Form B analyzes a single-income property, Form C compares various investments, Form D compares tax results from various types of taxable income, and Form G determines the gain on sales subject to income tax. The fifth form is the Net Proceeds of Sale, and the last is Form I-A, which calculates the true rate of return in percentage form. This program package sells for \$59.95.

T80-FS1 Flight Simulator



See your dealer!

Available for Model I or Model III. \$25.00 on cassette or \$33.50 on disk (with enhancements). All versions require 16K.

If you order direct, please specify whether you have Model I or Model III (the media are different) and whether you want disk or cassette. Include \$1.50 and indicate UPS or first class mail. Illinois residents add 5% sales tax. Visa and Mastercard accepted.

If you don't yet own a disk, don't fret. You can upgrade anytime. Cassette users may send back their cassette (but not the manual) along with \$10 (first class shipping included) and receive the disk version.

subLOGIC

Communications Corp.
713 Edgebrook Drive
Champaign, IL 61820
(217) 359-8482
Telex: 206995

HOME TEMPLATES (Models I, II, III, 12, and 16)

These models manage your yearly budget, your weekly shopping list, an amortization schedule for your loan payments, determine how long your IRA money lasts after you retire, and calculate your IRS Schedule A deductions. It costs \$39.95 and comes on disk.

SOUTHWEST SYSTEMS
Microcomputer Sales & Services
44 3rd Ave., Suite F
Chula Vista, CA 92010
619-425-5500

FULL SERVICE PAYROLL
(Models I and III)

Provides for up to 100 employees grouped into a maximum of six different departments. This flexible method provides for payment of employees on salary, hourly rates, commission, or draw accounts. There are 20 different deduction categories used to automatically compute non-standard deductions for employees. The system uses either pre-printed checks or a regular company checkbook. A versatile error-check feature provides for checkpoints during payroll processing.

At the end of each quarter, the 941 continuation sheet is prepared, as well as a summary for preparation of state and federal tax forms, and a summary of non-standard deductions by category. This program sells for \$150, and the accompanying documentation costs \$15. This program contains California state tax computations, so you must inquire about the availability of other states' before ordering.

Southwest Systems manufactures several other business-oriented programs that include Minibiz Bookkeeping System, Aircraft Maintenance System, Project Cost Control System, Manufacturer's Cost Estimating System, Order Entry & Invoicing System, and much more.

STAR VALUE SOFTWARE
12218 Scribe Drive
Austin, TX 78759
512-837-5498

OPTIONVUE-A
(Models I and III) (48K)

A stock market spreadsheet program for brokers and individual investors that compares investment alternatives

using basic option strategies. The program quickly answers "what-if" questions and is capable of handling the following types of investments: ordinary stock purchase or short sale, ordinary call or put option purchase, covered writing, naked writing, and ratio writing. It is available on disk or cassette for \$189 which includes documentation and shipping.

OPTIONVUE-B
(Models I and III) (48K)

Also a spreadsheet program, but designed to work with situations involving the simultaneous use of two options on the same underlying stock (spreads, straddles, and combinations). The program takes into account an estimate for trade commissions based on the user's choice of full service or discount broker, and opening cost is based strictly on the Securities and Exchange Commission rules for margin requirements. Available on both disk and cassette, it sells for \$189.

OPVALU/ADVANCED OPVALU
(Models I and III) (32K)

OPVALU is a program for determin-

ing the fair market value for listed put and call options. It is ideal for spotting an overpriced or underpriced option in the market. It sells for \$39.95.

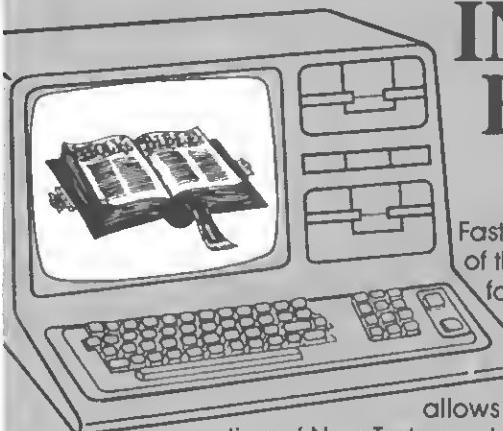
Advanced OPVALU determines the fair market price for arrays of listed put and call options on a single issue. It is available for \$129. Both come on either disk or cassette and with complete documentation.

TARANTO & ASSOCIATES INC.
P.O. Box 6216
121 B Paul Drive
San Rafael, CA 94903

PAYROLL (Models I and III)

Consists of 28 programs that maintain files, perform pay entry and verification, compute pay and deduction amounts, and print reports and forms. Employees may be hourly or salaried, and miscellaneous deductions are selected on a one-time or recurring basis. You can write paychecks outside the system and incorporate data into files for inclusion in historical records, payroll journals, and tax forms. This package computes all taxes, and is capable of printing 941A and W-2

Now use your home computer for IN-DEPTH BIBLE STUDY



Fast! Thorough! For serious students of the Bible, an exciting new tool for analysis of Scripture is available through the use of computer technology.

BIBLE SEARCH Version 1.3*

allows you to display or print any portion of New Testament text from disk tiles, scan the text for topics you specify, and edit and retain reference lists of selected verses for future use.

Software, comprehensive instruction manual, and King James Version New Testament database \$140

When ordering, please specify disk format and DOS.

Old Testment available soon at an additional cost (less than \$100).

Send check or money order to:



P.O. Box 6131-C, Dept. 8M
Orlando, FL 32853 (305) 896-4264

v431

*Bible Search currently requires a TRS-80 (TM of Tandy Corp.) Model I or III with 48K memory and two disk drives. Inquire about its availability on other computers.



ORVEL P. ORMAN
Widget Manufacturing
2345 Woodland Ave.
San Francisco, CA 94128

STATEMENT

DATE	10/09/80
ACCOUNT NUMBER	0035
SDO	

No 1301
PAGE 1

AMOUNT ENCLOSED \$ _____

RETURN THIS PORTION WITH PAYMENT

DATE	CHARGES AND CREDITS	AMOUNT
10/08/80	BALANCE FORWARD	4,055.00
10/08/80	LLLLLLL CHARGE	27.00
10/08/80	21345 CHARGE	80.00
10/08/80	998 PAYMENT	750.00-
10/08/80	999 PAYMENT	200.00-
	SERVICE CHARGE	43.05
	NEW BALANCE DUE	3,255.05
CURRENT	30 DAYS	50 DAYS
150.05	0.00	55.00

Taranto & Associates

Thank You

A statement sample from Taranto's Accounts Receivable Balance Forward program.

forms. It sells for \$75, and the user's manual costs \$20.

This is just one of several business software programs that Taranto & Associates makes for the Model I/III. Other programs include Accounts Payable, General Ledger, Cash Journal, Accounts Receivable, Invoicing, and Inventory Control.

MEMBERSHIP ACCOUNTS RECEIVABLE (Models II, 12, and 16)

This package is for organizations that supply products or services to organization members, rather than customers. The program monitors up to 8,000 members and 20,000 transactions. Special features include a balance-forward system that discards transactions at the end of a month, cash accounting that reports income as collected, and monitors up to 38 income accounts for direct posting, a periodic billing facility for dues that has 20 different dues rate categories to select from, recurring transaction facility for individual members, aged statements with descriptive reference, and selective mailing facility in member code or zip code sequence. This software package is available for \$500, and runs under

TRSDOS or CP/M.

Taranto & Associates Inc. makes several other business programs for Radio Shack Models II, 12, and 16. Other programs of interest include Accounts Payable, Purchase Order, Payroll, Job Costing, Inventory Control, Accounts Receivable, Invoicing, Sales Analysis, and so on.

THE SOFTWARE ESTABLISHMENT
31230 Cedarvalley Drive
Westlake Village, CA 91362
213-991-7711

SERVICE BILLING SYSTEM (CP/M)

This CP/M program is a complete billing package featuring a letter writer that automatically adds the customer's name and address, a calendar system, and a label and envelope generator. Customers are charged three ways: unit billing, automatic billing, and flat rate charges. Five different management reports collect and incorporate statement information. In addition, this program handles taxes, commissions, and credit cards. The disk program sells for \$618.

THE SOFTWARE TERMINAL

P.O. Box 53376
223 Fairway Drive
Fayetteville, NC 28305
919-483-2003

INSURE: LIFE INSURANCE AGENT MANAGEMENT SYSTEM (Model II)

Designed for a single life insurance agent or agency. The system stores 480 bytes of client information in the Client Master file alone. In addition, separate files maintain information on policies, source of payments and descriptions, paid business, and pending business. Major features of Insure include records accessed in under two seconds, over 900 client history records of almost 40 items per disk, full screen editing, summary reports of income by agent or company, mailing list and labels, and a file for keeping MDRT credits for each agent with credits automatically figured. A demo disk with documentation costs \$25 and can be credited toward the system price of \$250.

ACCOUNTS RECEIVABLE (Model II)

This system handles the receivables of a small- or medium-sized business. It helps management keep a hand on billing, and monitoring incoming funds. Special features of this program include full screen editor; up to 1,000 receivables monitored; file access in under two seconds; sales and payments posted using transaction codes for easy-to-follow audit trails; sales information transferred to inventory; and statements aging reports, transaction journals, and alphabetical account listings printed. A demo disk with documentation costs \$25 and is credited toward the system cost of \$200. You can purchase both the Accounts Receivable and Inventory Management System for \$300.

INVENTORY MANAGEMENT SYSTEM (Model II)

This program provides you with current information concerning sales inventory volume, present purchases, and inventory performance. It stores up to 3,000 inventory items and 900 vendors on disk. Any stock item is accessed in under two seconds. Sales information enters from the screen or from the Accounts Receivable without rekeying. In addition, all vendors and/or stock can be automatically transferred from Radio Shack's IMS without rekeying.

The Next Generation:

SUPERLOG

ADVANCED ELECTRONIC NOTEBOOK
BY KSoft

Over the past two years, LOG Electronic Notebook has quietly been creating a revolution in personal information management. Designed to emulate a familiar pencil and notebook, LOG Electronic Notebook can do for random information what a spreadsheet program does for numbers.

Now, even the best has been improved! KSoft is pleased to announce SUPERLOG, the next generation of the LOG family. SUPERLOG is not a patch! It is a totally rewritten version of the original LOG concept, fully compatible with the LDOS 5.1.3 operating system currently endorsed by Tandy.

SUPERLOG retains all of the versatile features of LOG while adding many new options requested by professional users: Floppy or Hard disk. Any number of LOG files per diskette. 1 to 32767 pages per file. Password protection and error checking. New text editing commands include automatic text Wrap-Around, Expand and Delete for entire lines, a Page Copy command, and an Undo key to reverse editing changes. Cursor motion is more flexible with new key commands plus a Forms simulator. The SEARCH function is greatly enhanced with a Wild-Card character, case-independent search, and multiple word search at 10 pages/second.

Also Note: SUPERLOG is now fully interrupt activated; it may be accessed from practically any foreground task including LDOS Utilities, LBASIC, LSCRIPT, EDAS, etc. with non-destructive return to the foreground program. No other information management program is this versatile!

Write or call Today! We'll be glad to tell you about SUPERLOG and what it can do for you!

SUPERLOG Specify Model I or III. \$119.95

LDOS 5.1.3, 48K, and 2 Drives required.

(Model IV version to be offered soon.)

LOG TRSDOS versions, Models I, II still available.

KSoft (601) 992-2239

319 Lakeside Drv
Brandon, MS 39042

Mastercard and Visa accepted.

Add \$5.00 for shipping and handling.

(TRSDOS is a trademark of Tandy Corporation)

(LDOS is a trademark of Logical Systems Inc.)

✓331



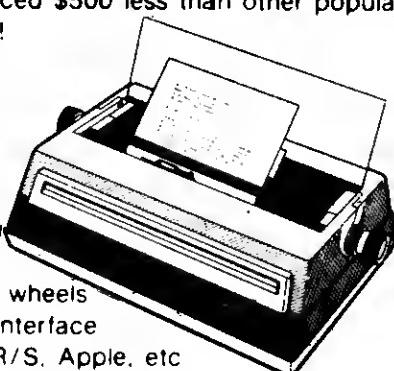
DAISY WHEEL

New Smith Corona TP-1

True letter quality printer for less than the cost of an office typewriter! Priced \$500 less than other popular daisy wheel printers!

SALE PRICE:

\$459



FEATURES:

- ★ Friction feed
- ★ 15 cps. 120 wpm
- ★ Changeable daisy wheels
- ★ Parallel or serial interface
- ★ Compatible with R/S, Apple, etc



SUNLOCK SYSTEMS

4217 Carolina Ave

Richmond, Va 23222

✓456

ADDITIONAL PRINTER SPECIALS

Epson	Okidata	Gemini	C.Itoh	
RX80	\$329	82A	\$399	10 \$319
80FT	429	83A	639	10S 409
FX80	559	92	499	15 469
FX100	739	93	849	15S 559
				F10-40 1149
				F10-55 1595

WE WILL MEET ANY ADVERTISED COST IN-STOCK
TO ORDER CALL TOLL FREE 800-368-9191

In Virginia call 804-321-9191

We accept MasterCard, Visa and CODs



MIDWEST
COMPUTER
WHOLESALE



AS A WHOLESALER, MCH'S SERVICE IS NOT RECOMMENDED FOR EVERYONE. A WHOLESALE TRANSACTION IS BEST SUITED TO THE INFORMED OR EXPERIENCED SHOPPER, ONE WHO KNOWS HIS NEEDS. IF YOU ARE A BEGINNER WE ASK THAT YOU DEAL WITH A RETAILER WHO'S HIGHER MARKUP ALLOWS THE "HAND HOLDING" LEVEL OF SUPPORT WHICH WE CAN'T PROVIDE AT THESE PRICES. IF HOWEVER YOU DON'T NEED "HAND HOLDING" WE CAN OFFER YOU TREMENDOUS VALUES AND SAVINGS ON ALL YOUR COMPUTER SYSTEMS NEEDS. PLEASE READ ON.

**CHECK THESE SAMPLES OF OUR PRODUCTS
GIVE US A CALL IF YOU DON'T FIND
EXACTLY WHAT YOU ARE LOOKING FOR**

COMPUTERS * * *
TRB-80 MOD4 64K (2) DRIVES 40TR/BB/DD.....\$1549.00
TRB-80 MOD2 64K (1) DRIVE 77TR/BB/DD.....\$2500.00
VICTOR 9000 128K (2) DRIVES 80TR/BB/DD.....\$2995.00
SANYO MEC-1000 64K (1) DRIVE 40TR/BS/DD.....\$1690.00

RAW DISK DRIVES * * * (WE STOCK TANDON AND MPI)
40 TRACK SINGLE SIDE DRIVES FROM.....\$147.00
40 TRACK DOUBLE SIDE DRIVES FROM.....\$184.00
80 TRACK SINGLE SIDE DRIVES FROM.....\$202.00
80 TRACK DOUBLE SIDE DRIVES FROM.....\$272.00
77 TRACK SINGLE SIDE 8" DRIVES FROM.....\$357.00
77 TRACK DOUBLE SIDE 8" DRIVES FROM.....\$462.00
SINGLE CASE AND POWER SUPPLY 5" FROM.....\$53.00
DUAL CASE AND POWER SUPPLY 5" FROM.....\$86.00
SINGLE AND DURL 8" CASE AND POWER SUPPLY FROM...\$200.00

MINCHESTER HARD DRIVES * * *
(5) SIZES COMPLETE, CASE, POWER SUPPLY, DOB, MOD 3 OR 4
6.4 MEG.....\$1499.00
12.8 MEG.....\$1649.00
14.3 MEG.....\$1749.00
19.1 MEG.....\$1849.00
31 MEG.....\$2399.00

PRINTERS * * *
EPSON FX-80.....\$559.00
EPSON MX-100.....\$675.00
SMITH CORONA TP-1.....\$499.00

CABLES * * *
(2) DISK DRIVES.....\$14.00
(4) DISK DRIVES.....\$26.00
PRINTER STD PARALLEL.....\$18.00
RS-232C.....\$15.00
SPECIAL CABLES MADE TO YOUR SPEC'S\$CALL

MISCELLANEOUS * * *
COMPUTER POWERLINE FILTERS FROM.....\$25.00
J-CAT MODEM 300 BAUD DIRECT CONNECT.....\$109.00
SMART-CAT 1200 BAUD, AUTO ANS/DIAL DIR/CONN.....\$445.00
SMART-CAT 300 BAUD, AUTO ANS/DIAL, DIR/CONN.....\$190.00
GREEN CRT FILTER .0125" THICK.....\$9.50
5.1 MEG MOD3 SPEED-UP KIT.....\$79.00
16K MEMORY KIT (150NS PRIME NEC CHIPS).....\$18.00
64K MEMORY KIT (150NS PRIME OR CHIPS).....\$59.00
MOD4 128K MEMORY UP-BRIDE KIT COMPLETE.....\$69.00
PRINTER SWITCH, 2 PRINTERS ON ONE COMPUTER.....\$68.00

DISKETTES * * * (BOX OF 10).....\$16.00
40 TRACK SBL SIDE, DBL DENSITY.....\$20.....\$25
40 TRACK DDL SIDE, DBL DENSITY.....\$30.....\$35
80 TRACK SBL SIDE, DBL DENSITY.....\$30.....\$35
80 TRACK DDL SIDE, DBL DENSITY.....\$43.....\$43
40 TRACK DBL SIDE, DBL DENSITY (FLIP/PY).....\$30.....\$30
PRICES AND SPEC'S ARE SUBJECT TO CHANGE, WITHOUT NOTICE

TRB-80 IS A TRADEMARK OF RADIO SHACK-DIV OF TANDY CORP.
ALL TRB-80'S FROM MCH ARE CONSTRUCTED TO OUR SPEC'S AND
ARE COVERED BY OUR WARRANTY SEE NOTE BELOW.

* * * PAYMENTS * * *
WE ACCEPT VISA, MC, MONEY ORDERS, AND CHECKS. NOTE
NON-CERTIFIED CHECKS REQUIRE (2) WEEKS FOR BANK
CLEARANCE. NO SALES TAXES ARE COLLECTED ON SALES
OUTSIDE OF MICHIGAN.

* * * DELIVERY * * *
SHIPMENTS ARE MADE PROMPTLY FROM STOCK, VIA
UPS, (SIZE PERMITTING), OTHERS, BEST WAY. COSTS
UNLESS OTHERWISE NOTIFIED ARE 2.5% OF THE ORDER
TOTAL BUT NOT LESS THAN \$3

* * * WARRANTY * * *
YOUR HARDWARE PURCHASE IS COVERED BY AN MCH 90 DAY
LIMITED, PARTS AND LABOR WARRANTY OR THE WARRANTY OF
THE ITEM'S MANUFACTURER CONFIRM YOUR COVERAGE WHEN
PLACING AN ORDER. COPIES OF THE WARRANTY ARE AVAILABLE
ON REQUEST.

MIDWEST COMPUTER WHOLESALE
PO BOX 39278 DETROIT, MI. 48239
TELEPHONE ORDER LINE (313) 525-3040

Useful reports include reorder point, price list, performance report, and full listing of inventory. The \$25 for a demo disk and documentation can be credited towards the system price of \$175. Both this program and the above Accounts Receivable program can be purchased together at the special discount price of \$300.

THINK SOFTWARE INC.
572-810 W. Broadway
Vancouver, BC,
Canada, V5Z 4C9
604-261-7261

WALL STREET TAP SYSTEM
(Models I and III)

Consists of three computer programs: Stockline, an advanced stock appraisal package; The Stock Stalker, a beginner's stock analysis program; and the TAP Communications Package, a terminal package for downloading information from CompuServe.

Stockline provides comparison charts, moving average, on-balance volume, point and figure, and price/volume charts. All for \$149.95. The Stock Stalker, the simpler stock appraiser, is available for \$59.95 and offers comparison charts to spot confirmation signals and relative strength, and price/volume charts to analyze price and volume trends.

The Wall Street TAP sells for \$59.95 alone, and if you order both the Stockline and the TAP together you save 10 dollars and get them for \$199.95.

TSASA INC.
2 Chipley Run
West Berlin, NJ 08091
609-346-3063

(Color Computer)

This software manufacturer has over 30 business programs compatible with the Color Computer. A small sampling of the available software for business use includes The Accountant, Accounts Receivable and Payable, Order Tracker, Business Inventory, Cash Flow Model, The Predictor-Linear Regression, Investment Analyst, Utility Bill Saver, and much more.

UNIVAIR INTERNATIONAL
9024 St. Charles Rock Road
St. Louis, MO 63114
314-426-1099

LEGAL TIME AND BILLING SYSTEM (Model II with CP/M)

Designed for attorneys, architects, accountants, administrators, and other professionals who provide services on a time and expense basis. The system contains a full accounts receivable package on clients, and a project management program.

In addition to setting up files for all of the clients and staff members, the system allows definition of a data base containing up to 900 categories of projects, as well as 1,000 service codes for specific types of work performed. These

codes may be defined as either fees or expenses.

Projects or cases are easily entered and can be cross-referenced in several ways. Twenty-six types of reports and statements are generated with this program, including Inter-Office Master Reports, Client Master Activity Reports, Daily Office Production Reports, and Monthly Statements and Forms. The entire package sells for \$950; a demo package costs \$250.

This Legal Time and Billing System is one of 10 business programs manufactured by Univair International. They have Management System programs for Medical, Dental, Insurance, and Real Estate practices. In addition, they make Accounts Receivable/Payable, General Ledger, and Inventory programs.

UNIVERSAL DATA RESEARCH INC.

2457 Wehrle Drive
Buffalo, NY 14221
716-631-3011

DATA-BASE MANAGER
(Color Computer and Model III)

Part I of this system creates data-base files that can be updated or modified at any time. It prints reports after you select print parameters and the fields to be printed. In addition, it compresses and sorts files. Part II of the program edits the file header for any Data-Base-compatible program, transfers data from one file to another, creates

GRADE BOOK

- Disk program (one disk required)
- Simple comprehensive
- Teacher designed and acclaimed
- In use for over 3 years
- No computer knowledge required
- Line printer optional
- Guaranteed

IBM-PC	TRS-80 I/III	APPLE II
\$36.95	\$34.95	\$36.95

- Brain CompuTeasers IBM-PC, APPLE \$19.95
- Testmaster Series IBM-PC \$19.95 each
- Boggle Word Game IBM-PC \$10.95
- Jeopardy! TRS-80 I/III \$29.95
- Factor Label (CAL) TRS 80 I/III \$29.95
- Grade Point Average IBM TRS-80 \$7.95

D
E
C

COMPUTING

Dept. 200
609 Oakleaf Drive • Garrett, Indiana 46736



THE UNIQUE PERSONAL COMPUTER PROGRAM FOR COIN COLLECTORS

- The program that makes cataloging your U.S. coin collection a snap!
- Data file with latest Market Value for all grades of most coins supplied on program disk.
- Quarterly Market Value updates available.
- Multiple printed reports give Inventory Value - Profit & Loss - Tax / Insurance Information.
- Concise Users Manual included.
- Available for 48K TRS-80 I/III 64K IBM-PC.
- Write for free brochure or order now.

Price - \$95 (Calif. residents add 6% Sales Tax)
plus \$1.50 to cover postage and shipping
COMPU-QUOTE Telephone 213/348-3662
6914 Berquist Ave. Dept. 80 Canoga Park, CA 91307

IEEE-488 TO TRS-80* INTERFACE

Everything needed to add powerful BASIC GPIB-488 controller capability to TRS-80 Model 1, 3 or 4, Level 2 or DOS with a minimum of 18K.



488-80C
For Model 3 or 4
Operation

488-80B
For Model 1
Operation



Model 488-80B or 488-80C Price: \$375
+ shipping, insurance & tax

WHEN ORDERING SPECIFY DISK OR TAPE

SCIENTIFIC ENGINEERING LABORATORIES

11 Neil Drive • Old Bethpage, NY 11804

Telephone: (516) 694-3370

*Trademark of Tandy Corp.

There is no affiliation between Scientific Engineering Laboratories and Tandy Corp. or Radio Shack.



My wonderful upgrade offer:

**If you bought my accounting software a while back,
it's good news.**

If you didn't, it's a good reason to buy it now.

You're probably growing. My software keeps growing too.

I've tinkered with it right along, improving it constantly. My accounting systems now work for CP/M, TRSDOS and MS/DOS (the IBM PC). It's a natural outgrowth of my support. Talk to a few thousand users on the phone, and you get a few new ideas.

Early on, I resolved that none of my customers would suffer if they bought a system before I improved it. So I've made this offer ever since I started over four years ago:

No matter when you bought, I'll upgrade any of my accounting systems to its latest capability on the same machine for \$25. If you've upgraded your machine, I'll give you a replacement system for either \$25 or the difference between what you paid for your software originally and the price of the new

software. If you've gone from a TRS-80 Model I to a Model II/16 or an IBM PC, say, you get a full credit for whatever you paid me for your Model I systems. Just send me your old disks and I'll send you the new ones.

It's this simple. If you ever buy any of my software, you'll never lose your investment. I wish the whole world were that simple.

Taranto
& ASSOCIATES, INC.

✓70

Model I, Model III and Model 4 systems: Accounts Payable, Accounts Receivable, General Ledger, Inventory Control, Invoicing, Payroll.

Model II, Model II/12/18, CP/M and IBM PC systems: General Ledger, Accounts Payable/Purchase Order, Accounts Receivable (Open Item or Balance Forward), Payroll/Job Costing, Inventory Control.

Post Office Box 6216, 121 Paul Drive, San Rafael CA 94903. Outside California, toll free (800) 227-2868. In California, (415) 472-2670.

keyfiles for sorts, modifies data within a file using conditional operations, and prints any size or number of mailing labels. Parts I and II of this system each cost \$99, as does the Model III version.

The Data-Base Manager program is one of 12 business programs that Universal Data Research Inc. makes for the Color Computer. Additional programs include Accounts Receivable/Order Entry, Accounts Payable/Purchase Order, General Ledger System, Report Writer II, Balanced Billing System, Inventory II, Payroll Package, Manufacturer's Inventory, and so on.

VOLKSMICRO COMPUTER

SYSTEMS INC.

202 Packets Court, Suite C

Williamsburg, VA 23185

804-220-0005

COMMWHIZ (Models I and III)

A smart-terminal, machine-language program that provides all the features normally needed for interchange with hosts such as Source, CompuServe, Bulletin Board Systems, and other computers. Features of this system include two user-defined messages (up to 40

characters) for Logon and Password or ID; a continuously displayed status line that shows the status of the mode, buffer, printer, autobuf, and communications settings; easy mode changes; default initializations for the most frequently used case; one-key commands; and special characters that include underscore, wave, reverse slash, and brackets.

Also included is TMODEM, a file transfer program for automatic transfers of any file (even if in machine-language programs) between you and others having TMODEM. This package is available on disk for \$79.95. If you don't have a modem, you can purchase their Hayes Smart Modem and Commwhiz for \$299, a savings of \$59.95.

XYZT COMPUTER

DIMENSIONS INC.

2 Penn Plaza, Suite 1500

New York, NY 10121

212-244-3100

NEW INTERACTIVE COMPUTING ENVIRONMENT (NICE)

NICE integrates existing packages for microcomputers into one user-friendly system. The whole environ-

ment is multifunctional—it can be used for the development of new application software packages, or for enhancing and customizing existing ones. NICE is comprised of six subsystems, three of which have direct business application. All sell for \$75 each and are compatible with Models I and III. The entire NICE package is available for \$450.

Report Writer supports all kinds of reports, invoices, mailing labels, and customized letters off a data base. Forms can be easily specified and printed out with the necessary computations, totals, subtotals, headers, and trailers.

Database Facility is designed to access records within one second. It has an unlimited number of both files (each file of up to 255 fields of 64 characters each), and keys (every field can be a key). Three levels of key readiness allow fast data entry mode and fast retrieval. It has easy file definition and maintenance, and can be called directly from Basic.

Library Support Option creates libraries for logical organization of your files and programs, saves space, increases speed of operation, and eases file manipulation. Up to 240 files per library, with practically an unlimited number of libraries. ■

Surface Plot

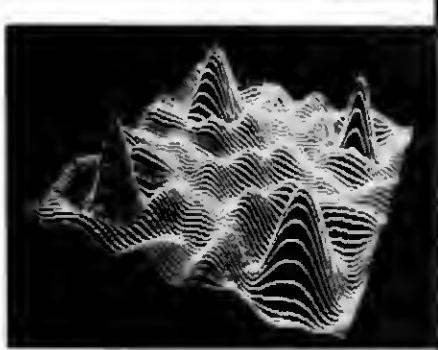
The Grafyx Solution® with Depth



Outstanding Grafyx. SURFACE PLOT lets you broaden your imagination by creating amazing three-dimensional views with Grafyx Solution. Micro-Labs' Grafyx Solution is a plug-in, clip-on board which gives you 98,304 points in a 512 x 192 matrix. That's sixteen times as many points as a standard Model III! Another unique feature is the ability to display the hi-res screen along with the normal text and low-res screen.

Flexible Grafyx. SURFACE PLOT allows you to enter an equation of the form $Z=F(X,Y)$ where Z is the height above the surface for a given X, Y coordinate. For example, entering the equation $Z=10-X^2$ draws a hill. The final picture can be viewed from any position in space so you can see an image from underneath, above, or even inside a hill or valley on the plot surface. You can also specify the size of the resulting image.

Complete Grafyx. The program automatically removes hidden lines for



best results. The documentation contains complete instructions and sample equations so that you will have your computer hard at work without delay. The finished plot can be saved on disk or printed on any of 20 popular printers.

The Grafyx Solution package is shipped from stock and includes the board, 44 programs including an 80-Column display driver and Extended Graphics Basic, and a 54 page manual all for \$299.95. The SURFACE PLOT program, twelve hi-res pictures, and manual is \$39.95. Shipping is FREE on pre-paid or COD orders. (Tx. residents add 5% sales tax.)

• 464 MICRO-LABS, INC. 214-235-0915
902 Pincrest, Richardson, Texas 75080

THE PROGRAM STORE

Guarantee: We will ship your order for items in this ad within 48 working hours or you get 20% OFF! (Books/non-released items excluded. Gift certificate issued when shipped. Offer expires September 10, 1983)

VEXUS

by J. Weaver from Soft Sector

Suspended in a tube in space you must escape! Dodge space ships, robots and debris as you make your way. The challenge and action will thrill you. Protect yourself in the last passageways of space!

36278 16K Tape \$10.95 \$16.96
36289 32K Disk \$21.95 \$18.66
15% off till Sept 10



JUNGLE BOY

by Dubois and McNamara from Displayed Video Are your reflexes fast enough to swing Jungle Boy from vine to vine? Fast paced arcade favorite—sweep through the jungle, swim by the alligators, dodge boulders rolling down the hill, save the maiden from fierce warriors. Joystick compatible with sound.

38281 16K Tape \$15.95
34825 16K Disk \$19.95

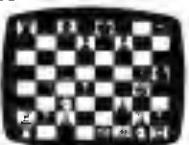


TIME RUNNER

by Y. Lempereur from FunSoft

Join the space rush! Avoid the defenders and watch out for the dangers of vanishing hyperspace. If you can make it, the territory is yours to claim. A real struggle for wealth! Incredible graphics, voice, sound, joystick compatible.

22655 16K Tape \$24.95
37280 32K Disk \$24.95



SARGON II

from Hayden

"The Classic Computer Chess Program" Sargon II will play you at your level, from beginner up through Grand Master; seven levels in all. Fast, tough, instructing and challenging with outstanding graphic display of the chess board.

18953 16K Tape Mod 1 & 3 \$29.95
18942 32K Disk Mod 1 \$34.95
12531 32K Disk Mod 3 \$34.95

FLIGHT SIMULATOR

by Bruce Artwick from Sub-Logic

A graphic tour de force that will truly captivate you. If you haven't seen this brilliant program, you haven't fully utilized the capabilities of your computer! During FLIGHT SIMULATION, you instantly select instrument flight, radar, or a breathtaking pilot's eye view. But be sure to strap yourself in—you're liable to get dizzy!

20956 16K Tape Mod 1 \$25.00 \$21.25
20967 16K Tape Mod 3 \$25.00 \$21.25
20978 16K Disk Mod 1 \$33.50 \$28.47
20989 16K Disk Mod 3 \$33.50 \$28.47
15% off till Sept 10



PENGUIN

by Dubois and McNamara from Displayed Video

Over 30 different mazes of ice blocks. Kick the obstructing blocks and watch them slide or crumble. Survive with threatening ice monsters chasing you. Watch out—they increase in numbers and get smarter with each frame. Keyboard or joystick controlled.

33983 16K Tape \$15.95 \$13.56
30711 16K Disk \$19.95 \$16.96
15% off till Sept 10



BABLE TERROR

by Y. Lempereur from FunSoft

Regain your castle! The traitors, once your servants, have built a maze of walls to keep you out. Determined, you must roam the network of paths and overcome the Bables to reclaim your legacy. Fast arcade action, voice, sound, joystick compatible.

16513 16K Tape \$19.95
32780 32K Disk \$24.95



SUSPENDED

from Infocom

Suspended between the agony of a dying planet and the fun of a great adventure, you are frozen in the planet's underground complex. Wired to computers, you control robots to solve the challenge of survival. Features a multiple save feature to guard the secrets of your mind!

26154 32K Disk Model 3 \$49.95



Programmer's Corner

EDIT

by Southern Software from Algorix

A professional full-screen editor for basic programs gives you faster program correction, less keystrokes, greater program visibility and fewer errors. Modify 15 lines at a time using auto repeating cursor control, scrolling, over-type, delete or insert. Replicate, copy, delete or move lines or blocks. Disk overlay version has instant access with minimal memory usage.

17626 16K Disk \$39.95 \$33.96
15% off till Sept 10

EARLY GAMES

by John Paulson from Early Games Co.

Nine, colorful, non-aggressive, interactive games develop basic skills and creativity as they entertain young children 2½ to 6 years old. Includes numbers, letters, shapes, and names plus a drawing option. No adult assistance needed!

33400 16K Tape Mod 1 & 3 \$29.95
32881 32K Disk Mod 1 \$29.95
26468 32K Disk Mod 3 \$29.95

GAMES AND GRAPHICS FOR THE TRS-80 A BEGINNER'S GUIDE

by Tom Dempsey from IJG

You'll learn all the steps in a logical progression with nothing "taken for granted." Sample game programs that you key in to learn about animated characters, sound, block moves, set/reset, screen drawing, arcades, subroutines and utilities. If you're starting from scratch—this book is for you!

\$16.95 SOFTCOVER BOOK

The PROGRAM STORE
now open in
Plymouth Meeting, PA
and
Cherry Hill, NJ

Over 2500 Programs for TRS-80, ATARI 400/800, APPLE, IBM & VIC 20.

Visit our other stores:

B29 Bethel Rd., Columbus, Ohio
Seven Corners Center, Falls Church, VA
W. Bell Plaza, 6600 Security Blvd., Baltimore, MD
White Flint Mall, Rockville Pike, Rockville, MD
Harvard Square, 13 Dunster St., Cambridge, MA

Opening Soon in Tulsa and Oklahoma City

Westmoreland Mall, Rte. 30 East, Greensburg, PA
Plymouth Meeting Mall, 500 Germantown Pike, Plymouth Meeting, PA
Cherry Hill Mall, Rte. 38 & Haddonfield Rd., Cherry Hill, NJ
Nanuet Mall, Rte. 59 & Middletown Road, Nanuet, NY
Monmouth Mall, Rte. 35 & Wyckoff Road, Eatontown, NJ

FRANCHISE OPENINGS IN SELECTED CITIES

© 1983 THE PROGRAM STORE

To Order Call Toll Free 800-424-2738
For Information Call (703) 556-9778

Mailorders:

Send check or M.O. for total purchase plus \$2.00 shipping and handling. VA add 4% sales tax
Charge cards — include all embossed information



THE PROGRAM STORE • Dept. 14-09-3 • Box 9582 • 4200 Wisconsin Avenue, NW • Washington, D.C. 20016

Item #	Title	Tape/Disk/Rom/Book	Price	Postage \$2.00	Name _____
Total					Address _____
<input type="checkbox"/> CHECK		<input type="checkbox"/> VISA		City _____	State _____ Zip _____
<input type="checkbox"/> MASTERCARD				Card # _____	Exp _____
				Computer _____	For TRS-80 Models I, III



-80

M-ZAL RELEASE
By Computer 2
Applications Unlimited

SAVE
\$20.00

M-ZAL™ - the Modular Z-80® Assembler Language for the TRS-80®. A complete development system for assembly language programmers. M-ZAL is a disk based package which gives you the ability to easily develop sophisticated machine language programs on your TRS-80 and/or your TRS-80. The package consists of three programs: FRED, a full screen general purpose editor; ASSEMBLER, a general purpose assembly language editor; and the object module linker. With them, you can tackle your greatest projects without fear. The modular concept makes it easy. If fails, you break your programming ideas down into small, manageable pieces called modules. You code each module separately, then link them together. You can edit, relocate and link all the cross references. The result is a complete Z-80 program that's up and running sooner because it's debugs faster. M-ZAL creates programs in both the loadable SYSTEM format and as diskresident CMD files.

SPECIFY MOD I or MOD III

POWERMAIL PLUS
By Powersoft

SAVE
OVER
15%

NEW FEATURES OVER POWERMAIL

Separates any category for you in any manner you wish! This new version can scan drives and may use multiple floppies. The program will sort on any eight levels if you wish. Scans your flags and puts them into another file. Full Output Labels & Listing. One choice is the simple telephone book. And store up to 1000 entries. It also includes the listing of addresses, but also enter FLAG numbers in the actual FLAG descriptions. The final print mode is what we call THE SAIFSMAN'S NOTEBOOK™. It prints out the whole list of whatever parts you specify with all info including full flag descriptions each record. Then the word Notes is printed with several lines of blank space for making those notes in the help!

MOD I/III or II/12/16

LOAN AMORTIZATION
By Big G Software

ONLY
29.95

User enters principal, interest rate, and term of loan, and computer calculates monthly or annual level payment amount. An amortization schedule may be printed on request. Amortization schedule includes interest in current payment, principal in current payment, interest paid to date, principal paid to date, ending balance, and calendar year totals for interest and principal paid

MOD III

CP/M 2.2
TRS-80 Model 4

ONLY 199.95

NEW
MODEL
VERSION

Run CP/M on your Model 4. Requires only the 64K Mod 4 to operate. Most CP/M applications Software was developed on 2.2. Why wait for the R/S version of CP/M+ requiring 128K to operate. Save hundreds by not adding memory. Run the most popular, most compatible CP/M... the industry standard. CP/M 2.2. Allows you to read most other diskette formats i.e. Osborne®, Kaypro®, Xerox®, etc.

More Specials

PROGRAM NAME	RETAIL	SPECIAL
BASIC/S SYSTEM MOD I/W80 III	40.95	20.95
MAKE 80 MOD I	10.95	14.95
MAKE 80 MOD III	10.95	14.95
POWER TEST W80 I/W80 III	20.95	24.95
SCSIPLUS 3.0 W80 I/W80 III	50.95	20.95
STBD III W80 I/W80 III.....	100.00	124.95
SOSPLUS II W80 II.....	249.95	150.95
MICROCASE W80 III	100.95	140.95

BOOKS

SUPER UTILITY TECO W80/GAL 3.0	14.95	11.95
JOHNSON SUPER UTILITY+ 2.2z	10.95	10.95
THE CUSTOM TRS-80	20.95	20.95
BASIC 80/Z I/0	20.95	20.95
TRS-80 Disk & Other Mysteries	22.95	19.95
TRS80 2.0 Decoded	20.95	20.95
MICROSOFT BASIC DECODED	20.95	20.95
BASIC FASTED & BETTER	20.95	20.95
MACHINE LANGUAGE DISCS I/0	20.95	20.95

MACRO-MON THE SHADOW

By Jake Commander

BELOW
DEALER
COST

A HURe DISCOUNT DATA BUY PASSES
THESE UNBELIEVABLE SAVINGS ON TO
YOU.

Formerly Manufactured by

ADVANCED OPERATING SYSTEMS

Now a DiskCount Data exclusive

The Industry's standard and the finest break point disassembler and machine language monitor available. The package includes a rich, padded case binder and complete 2 color documentation. New single step through your CMD files, view & change assembly op-codes, memory, etc. Used by Kim Watt for the editing of SuperUtility+.

MOD III Disk	00.85	Now Only	34.99
MOD I Disk	64.95	Now Only	32.99
MOD I Tape	59.95	Now Only	29.99

Quantities Limited & Subject to Prior Sale

SPECIAL OFFER

Any order of \$100 or more from this Ad will receive one choice of the following absolutely

FREE

Gree Widow (specify Model)
Inside Super Utility+ 2.2z
Macro-Mon The Shadow
(specify Model)

Any order over \$200 will receive the following 2 programs free.

Macro-Mon The Shadow
and
DOSPLUS 3.3 or 3.4

(Specify Model numbers on both.)

Note: Orders of LDOS or MULTIDOS do not qualify as DOSPLUS is already included at no charge.

DOSPLUS 3.5

By MicroSystems Software

SAVE
\$30.00

The latest revision of an excellent operating system, DOSPLUS 3.5 packs even more features than its predecessors. Review the current ads for its benefits. Available for MOD I single or double density and the MOD III. Now compatible with most other systems.

SPECIFY MOD I or MOD III

SOFTWARE AUTHORS

DiskCount Data may be interested in marketing your program. Send evaluation copies to address below, Attn: Software Evaluation Dept. We are interested in high quality programs.

DiskCount
Data TM

/ 204

214-680-8288

Phone Your Order In Today Or Mail To
DISCOUNT DATA
2701-C W 15th St., Suite 324
Plano, TX 75075
Office Hours Mon-Fri 10 A.M. to 9 P.M. C.S.T.

Send Cash, Check or Money Order
Please add \$3.00 for postage and handling additional
\$1.50 for C.O.D.'s

Foreign orders welcome, please specify air or surface. All shipping charges assumed by purchaser.

When ordering by mail, please specify computer model number (I, II, or III), drive configuration, and memory size.



AND



Cheerfully Accepted

SAVE ON OPERATING SYSTEMS

BUY LDOS 5.1 at \$129

or

MULTIDOS 1.6 at \$99

and you receive

DOSPLUS 3.3 or 3.4

FREE

3.3 MOD I or III

3.4 MOD I or III

(specify)

Quantities Limited & Subject to Prior Sale

Satellite Word Processing

by Henry Aldrich

If your Model I/III is in heavy demand as a word processor, use Color Computers as satellite terminals and let the I/III do the printing.

Word processing with a Model I/III disk system is popular in my university department. However, the heavy demand for the system makes getting access to it difficult.

The most time-consuming aspect of word processing is typing in the copy. If satellite terminals were available for text preparation, you could prepare copy on a terminal and use a computer to do the printing. I'll describe such a system using a Color Computer as the satellite terminal and a Model I/III as the host computer.

I initially hoped that I could transfer text between the Color Computer and a Model I/III since both write to and read from tape at 1,500 baud. Unfortunately, the Model I/III does not read Color Computer tapes. The two

computers format lead-in and termination information differently, so that reading tapes from one computer by the other doesn't work without changing these parameters.

Machine-language programs could probably be developed to accomplish this; however, my configuration works without special software and requires no hardware modifications. You do, however, have to make simple cable connections.

The System

The satellite word-processing system described here is relatively low-cost. Tandy's 16K Color Computer sells for \$199.95 and a Color Scripsit ROM pack costs \$40. Almost any black and white television set serves as a Color

Computer monitor for word processing. See Table 1 for a list of software and hardware requirements.

This system provides the most important features of text formatting except superscripts, subscripts, and underlining. However, these capabilities are available with word-processing software from independent suppliers.

The Color Computer's 16K memory provides storage for about six single-spaced or 12 double-spaced pages. As you near this storage limit, you should store text files in blocks on tape. The amount of memory available is easy to judge since Color Scripsit displays it at the bottom of the screen.

It is possible to prepare text on the 16K Color Computer with Color Scripsit, then transfer the text across the built-in RS-232C interface to a Model I or III with its own RS-232C interface, disk drives, and a smart terminal program.

Once the Model I/III receives the text, it is stored on disk. Then, with the Model I/III running Scripsit or one of its enhancements, the main system loads, chains, and prints the disk files. Underlining and other sophisticated commands are quickly and easily inserted with the global change functions of Model I/III Scripsit.

Required Software

Color Scripsit, on plug-in ROM pack.
Lindbergh Software's Omniterm or similar smart terminal program for Model I or III.
Scripsit for the Model I or III.
Super Color Terminal program from Nelson Software (optional).

Required Hardware

TRS-80 Color Computer and monitor.
TRS-80 Model I or III with RS-232 interface.
Cable to connect RS-232 printer output of Color Computer to RS-232 interface of Model I/III.

Table 1. Required software and hardware.

The Key Box

Model I and III (32K RAM)
Color Computer (16K RAM)
Disk Drive
Printer



You've Got TOTAL ACCESS™

TO YOUR COMPUTER HARDWARE & SOFTWARE NEEDS. CALL ROSE TODAY!

AEROCOMP DISK DRIVES

External drives for TRS80 Mod. I or III, IBM PC & TI 99/4A are complete with power supply & enclosure. MPI or Tandon.

40 Track Single Side	\$199
40 Track SS "Flippy"	239
40 Track Dual Head	279
80 Track SS	299
80 Track SS "Flippy"	329
80 Track Dual Head	379
APPLE compatible w/cable (Shugart)	269
APPLE compatible disk controller	89

TRS80 Color Computer Drives	
First Drive	\$399
Includes controller, cable (2-D) and book	
Additional Drives.....	\$199

*All New! Half-High Drives Available Now. Call For Prices.

BARE DRIVES (MPI or TANDON)

Internal drives for TRS80 Mod. III, IBM PC & TI 99/41 (controller required)

40 Track SS	\$169
40 Track Dual Head	249
80 Track SS	269
80 Track Dual Head	339
8 inch Single Side Thinline	399
8 inch Dual Head Thinline	499

MODEL III DRIVES

Complete internal drive kits with 40 track drives, disk controller, power supply, all hardware & cables.

Drive Kit Only (no drives)	\$199
One Drive System Kit	369

Two Drive System Kit.....	539
---------------------------	-----

MODEL I DOUBLE DENSITY

CONTROLLER

AEROCOMP "DOC"	\$119
AEROCOMP "DOC" w/LDOS	169
AEROCOMP "DDS"	49
(Double dens. data separator for Percom Doubler, LNDoubler or Superbrain	
AEROCOMP "SDS"	29
(Single dens. data separator)	

MISCELLANEOUS DRIVE STUFF

TRSDOS 2.3 Disk & Manual	\$20
LDOS (Mod. I or III)	119
NEWDDOS/80, 2.0 (Mod. I or III).....	129
DDSPLUS 3.5.....	129
Diskettes (10 in library box).....	23
MX80 Ribbons	\$9
Drive Power Supply & Enclosure (5.25")	59
2-Drive cable	24
4-Drive cable	34
Extender cable	13

* Total Acess 1983

MICRO DECISION

\$1299

64K CP/M 2.2, two serial ports
MBASIC - WordStar - Logical
BaZic - Correct-IT
12" Green Video 80 x 25
Double Density (200K) Drive

FRANKLIN ACE1000

Uses APPLE Software
Call, it may be
cheaper by now

\$999

brother

EM-1 Electronic
Typewriter
Choose
Either One

\$799

EPSON FX-80

160cps Friction/Tractor (\$32 Option)
10,12,16.5 cpi
+ Doublewide
6.8,12 1pi

\$569

TRS-80 SPECIAL EQUIPMENT

80 x 24 Video Board for the Model III....	\$199
112K CP/M 2.2 for the Model III.....	\$399
16K Memory, 200nsec, Guar 1 yr	8/\$12
64K Memory, 200nsec, Guar 1 yr	8/\$48
12" Green Phosphor Monitor	\$87

SOFTWARE

Super Utility Plus 3.0 by Kim Watt	\$59
Alcor PASCAL, Model I or III	169
P&T CP/M for the Mod II	159
P&T CP/M for the Mod 16	189
P&T CP/M for the Hard Disk	199
All SNAPPWARE	**10%** OFF

I have lots of other software. Call me now for your needs. All at discount.

MEDIA & SUPPLIES

8" disks SS DblDen, Guar. Forever	\$29
8" disks DS DblDen, Same Guarantee.....	39
5" Flipsort, holds 75 disks	19
8" Flipsort, same deal	29
5" Library boxes	\$2.50
8" Library boxes	\$3.50
5" or 8" Head cleaning kit	9
Tractor paper, letter size 2900 sheets	25

LNW COMPUTERS

128K LNW-80 Model II, 80th NTSC & RGB outputs. RS232 and parallel printer port. Uses both 5" and 8" drives. Works on all known TRS-80 DOS's. Comes with DOSPLUS. Also works with CP/M 2.2 which is included at no extra cost. Now a FREE 12" GREEN PHOSPHOR monitor and cable included. All for the low price of

\$1695

PRINTERS & OTHER ACCESSORIES

ANADEX DP-9500A or 9501A	\$1239
ANADEX DP-9620A, 200 cps.....	1399
ANADEX WP-6000, 284 cps, NLQ	2695
PROWRITER, 120 cps, 10" Friction/Tractor.....	375
PROWRITER 2, 120 cps, 15" Fric/Trac	669
STARWRITER F-10, 40 cps Daisy Wheel.....	1250
PRINTMASTER F-10, 55 cps Daisy	1499
Rutishauser Bidirectional Tractor	199
Rutishauser Sheet Feeder	895

PERIPHERALS -

32K LNW Expansion Interface w/RS232.....	\$329
Mod III RS232 complete, ready to install... 79	
Signalman Mk I Modem 300 baud, direct connect	89

Please add \$5 handling charge to all orders under \$24

**ORDER NOW!
TOLL FREE
800-527-3582**

Write or call. Toll free lines are for orders only. Texas residents call 214/458-1966 and deduct \$2.00 from your order. If you need technical information or service use the Texas number. Prices are subject to change without notice and are mail order only. I accept VISA or MASTERCARD, you can send a check or money order (allow a couple of weeks for personal or company checks to clear) or order COD (cash, certified check or money order only). Shipping is not included unless otherwise indicated. Please add \$5 handling charge to all orders under \$24. Texas orders add 5% tax. No tax added on shipments outside Texas. Order up - I need the money!

TOTAL ACCESS™
P.O. BOX 790276
DALLAS, TX 75379
214-458-1966

NEXT DAY SHIPMENT on all in stock Merchandise.

Cable Construction

Building the cable is straightforward. You'll need a four-wire cable about 6 feet long (phone wire works well), a four-pin DIN plug (for the Color Computer output), and a 40-contact card-edge plug (for the Model I RS-232) or a 25-pin male DB 25 plug (for the Model III RS-232). Radio Shack stores stock all of these components.

The proper cable connections appear in Table 2. Most are obvious, except for the cable connection between the Color Computer's "receive data" line and the Model I/III "data terminal ready" line. This connection satisfies a system requirement of the Color Computer. Its input line must receive a constant signal from the Model I/III indicating that it is ready to receive data. This connection assures an uninterrupted data flow.

Set-up Procedure

Load Omniterm into your Model I/III. Set Omniterm parameters to match the printer default protocols of Color Scripsit. One of Omniterm's nice features is the ease with which you can change these parameters. Simply hit the @ key twice to enter the command mode and change the UART (universal asynchronous receiver-transmitter) settings to:

Baud	600
Data bits	8
Stop bits	2
Parity	None

Then open the input buffer by pressing the I key.

All of the other parameters can remain at default—printer off, screen reformat 54, carriage return suppression off, line feed suppression on, duplex full, echo off, CR/LF grouping off, and output from buffer off. Use the

break key to return to the display mode.

Interconnect the two computers with the appropriate cable as indicated in Table 1. If you're using a Model I, the Color Computer must be far enough away from it so the Model I's radio frequency interference doesn't disrupt the Color Computer's display.

Boot up the Color Computer with a Scripsit ROM pack in place. Load your text from tape, or type NEW TEXT. Reformat the line width on the Color Computer to your preference. I use a

*"You can use the
Color Computer as a
portable word processing
terminal. . . "*

32-character line width, so lines print as they appear on the screen.

Since Color Scripsit behaves as if it is controlling a printer, the computer transmits a carriage return at the end of each line of text. Failure to reformat the text before sending it to the Model I/III results in 32-character lines with a carriage return at the end of each line. You can remove them in Model I/III Scripsit, but it is tedious. Reformatting prior to transfer avoids the problem. Select the Print option from Color Scripsit's main menu. Then answer the "Printer or tape?" query with "Printer." Begin text transmission to the Model I/III. The color display scrolls as each line is printed.

Alternatively, you could use Nelson Software's Super Color Terminal program. It transfers text in the Color Computer's buffer directly to the Model I/III without carriage return commands at the end of each line, circumventing the problem found with Scripsit.

Save Color Scripsit's text files on tape

in the conventional manner. Then load Super Color Terminal from tape or ROM pack. Use its tape-to-buffer feature to load the Scripsit text file from tape into the buffer. Then, from the main menu, select "LPRINT BUFFER."

When transmission is complete, put your Model I/III into command mode and toggle the input buffer off by typing I. Save the data in the buffer on disk using the standard Omniterm choices from command mode. Return to the Model I/III disk operating system by using Omniterm's X command or by pressing the reset button.

Enter Scripsit in the usual way. Load the text file from disk. Operate normally in Scripsit to edit, print, and so on. If you use the Nelson program, remove the series of carriage returns corresponding to the pagination points on the Color Computer.

Color Scripsit in ROM pack does not display lowercase letters, but uses reverse video capital letters instead. This is surprisingly easy to get used to, however. Some of the cassette word processors, such as Telewriter, do display lowercase, but they require a 32K machine to provide sufficient text storage.

You might want to drive a printer directly with the Color Computer, particularly since many users already have a parallel printer. There are three economical options: first, serial printers, such as the Radio Shack DMP-100, for around \$300 by mail; second, Epson plug-in serial interface card for its parallel printers for less than \$100; finally, independent suppliers' universal serial-to-parallel converter for about \$70.

You can use the Color Computer as a portable word processing terminal, providing you take along a cassette recorder and the universal TV interface cord. Radio Shack sells a sturdy, inexpensive Color Computer vinyl case for transporting the unit. If you connect the Color Computer to a modem and use a smart terminal program such as Nelson Software's Super Color Terminal, it is even possible to transmit manuscripts or data to your home office from field locations or motel rooms. First check with the manager to be sure the alarm won't go off if you disconnect the room's TV cable from the set!

Sophisticated word processing capabilities are within nearly everyone's personal budget using this system, if a Model I or III is available for the final printing operations. ■

For Model I	
4-pin DIN (Color Computer)	to 40-contact card edge (Model I RS-232)
Pin 1 (CD: carrier detect)	to Pin 30 (CD)
Pin 2 (RD: receive data)	to Pin 34 (DTR: data term. rdy)
Pin 3 (SGND: signal ground)	to Pin 20 (SGND)
Pin 4 (TD: transmit data)	to Pin 22 (RD: receive data)

For Model III	
4-pin DIN (Color Computer)	to 25-pin DB 25 (Model III RS-232)
Pin 1 (CD)	to Pin 8 (CD)
Pin 2 (RD)	to Pin 20 (DTR)
Pin 3 (SGND)	to Pin 7 (SGND)
Pin 4 (TD)	to Pin 3 (RD)

Table 2. Cable specifications for Color Computer to Model I/III file transfer.

**TRS-80®
Programmer's Sourcebook**

TRS-80®
Programmer's
Sourcebook



First Edition

Now there is a national TRS-80 sourcebook with system software listings plus club listings, all in addition to many new application software listings, all of which are separated by model number. The first edition of this*, by 11-inch bright yellow publication is now in national distribution in both the US and Canada, and is available through your favorite computer store, book store (ISBN 0 912043-0) or you can order direct from us by sending \$4.95 (plus \$1.00 postage and handling) to

Ocean, Inc. ✓508

P.O. Box 2331
Springfield, VA 22152-0331

Visa and Master Card accepted.
(Dealer's inquiries invited.)

*TRS-80 is a registered trademark of Tandy Corp

INTRODUCING!!!

a FAST, SOPHISTICATED
and USER FRIENDLY
graphics and text program

✓75

KWIKDRAW

NEW!
from
Lichen
Software

WITH KWIKDRAW YOU CAN QUICKLY AND EASILY CREATE/EDIT DISPLAYS COMBINING GRAPHICS, TEXT, AND SPECIAL CHARACTERS. YOU CAN: • Save/Load displays to/from disk in 3 formats: BASIC/ASCII/object • Save/Load/Overlay displays to/from 10 RAM buffers • Print in a variety of formats, with multiple copy and BACKGRNDUN printing • 2 cursor sizes, each can move at one of 255 speeds from slow to VERY FAST! • Set delay before keys repeat • Have cursors stop at screen edge or wraparound to opposite edge • Fast line & circle • Move/Duplicate/Erase individual figures and/or text • Fill figures • Reverse black/white • Scroll entire screen with/without wraparound • 2 mirror image routines • View directories • 8 menu/help screens • AND MUCH MORE! Logical key assignments are easy to learn. 50+ page manual with instructions for using displays in your programs. What makes it KWIK? Written in 100% machine code — no SLOW BASIC or compiled BASIC! Backups allowed. REQUIRES: 48K Model III* & 1 disk drive. Printing routines require an Epson MX** series printer. TERMS: \$74.95 — cash, certified check, money order, or personal check. Allow 2-3 weeks for personal checks to clear, all other orders will be shipped within 48 hours. LICHEN SOFTWARE, 6603 N. LEE ST. SPOKANE, WA 99207, (509) 448-4026 *Trademark of Tandy Corp. **Trademark of Epson America, Inc.

**CRITICAL PATH
SCHEDULING**

SOFTWARE FOR THE TRS-80
MODEL II

- up to 500 activities per file
- comprehensive job calendar processor
- user-defined activity codes
- selective reports by code, status, criticality, sorted by date
- prints easy-to-read barcharts
- designed for unskilled operators
- proven on multi-million \$ projects
- 110 page manual includes primer on the Critical Path Method
- requires 64K Model II and 132 column printer

System U.S. \$495.00
Manual only ... U.S. \$ 25.00
(Incl. shipping & Handling)
Ontario residents add 7%
Send check or M.O. to:

CANADIAN MICRO SOFTWARE
P.O. Box 98, Station J,
Toronto, Ontario, Canada
M4J 4X8

ask about our upcoming version
for the TRS-80 Model III

✓279

UPGRADE

Micro-Designs System-Upgrade for the TRS Model III and 4

The Micro-Design TRS-80 upgrade includes Micro-Design's exceptional MDX-6 disk controller board, one 40 Track Disk Drive, necessary installation cables and hardware. Will also control external 8" Disk Drive Systems.

FOR MORE INFORMATION & FREE LITERATURE
CALL OR WRITE

MICRO-DESIGN

6301 Manchaca Road, Suite B
Austin, Texas 78745

Toll Free

1-800-531-5002
Texas Res. call 512-441-7890

\$399.00

See our ads on pages 349, 307, 41

✓463

Spacemap

by Hubert Borrmann

Contrary to what you're probably thinking, Spacemap isn't the latest Model I arcade clone—it's a track-by-track disk directory.

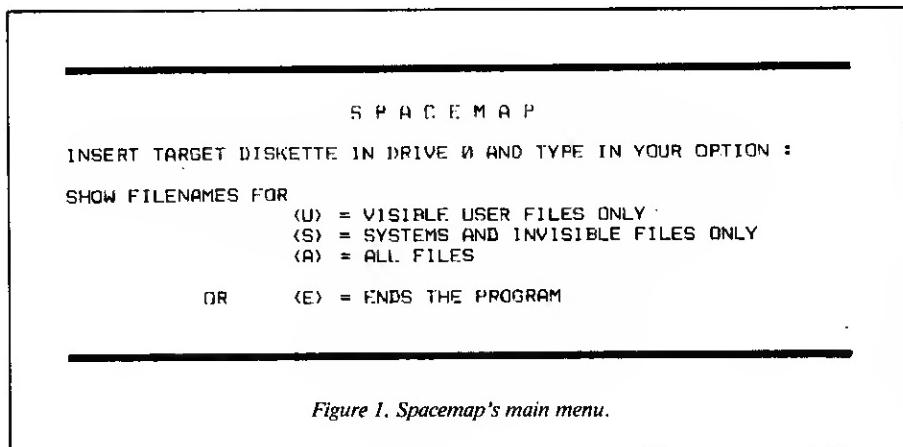


Figure 1. Spacemap's main menu.

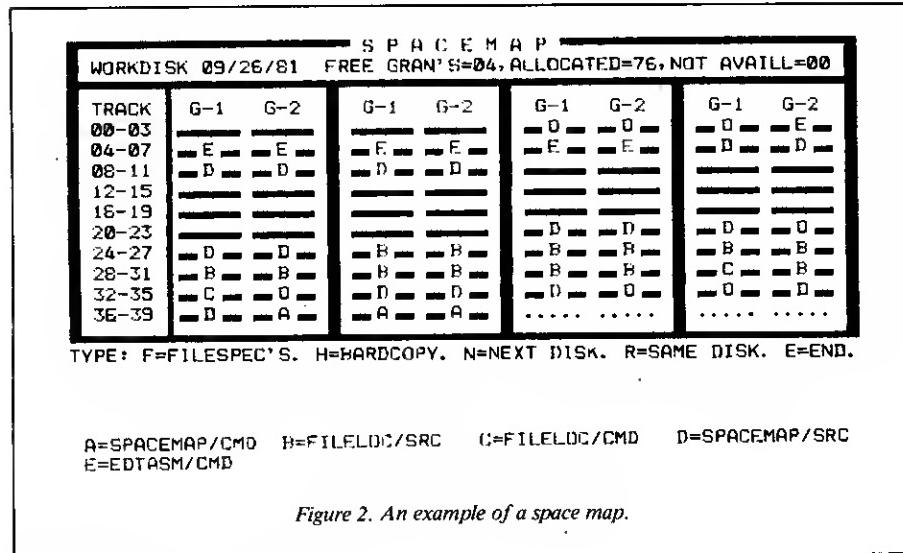


Figure 2. An example of a space map.

Have you ever needed to know where on a disk you have some free space? Or needed to locate a particular file to correct disk errors? I had the same problems and wrote a Model I program that identifies the location of a disk's files in terms of tracks and granules (see Program Listing).

I wrote the program in Assembly language for a 32K or 48K system with at least one disk drive. It occupies three granules on a disk, resides in memory from 7000-8F80 hexadecimal (hex), and works under TRSDOS, NEWDOS80, and DOSPLUS.

Spacemap in Action

When you boot up the program, a vanity screen first appears on the display while the program does some housekeeping chores.

Then the main menu appears (see Fig. 1). When you select an option, the program displays a space map like the one in Fig. 2. The display includes the name and creation date of the disk, the number of free granules, the number of allocated granules, and the number of granules not available.

It may seem odd that there are some grans unavailable. Spacemap is developed for 40-track disks; if the disk being mapped is formatted for only 35 tracks, the nonexistent tracks (35-39) are denoted under Not Available (see Fig. 3).

Visible User Files Only Options

The Spacemap directory identifies four tracks per line with a total of 10 lines on the display. Each track is subdivided into its two granules, labelled G-1 and G-2.

Figure 2 shows the space map of one of my disks, called Workdisk, after I selected the Visible User Files Only op-

tion. The free granules are indicated by dots. Tracks 38 and 39 are free. Solid lines denote the allocated granules. Only user files are shown with an identifying letter.

System and Invisible Files Only Option

Conversely, system files appear as a solid white line without a letter. For example, the program EDTASM/CMD, coded with the letter E, resides in track 3, granule 2 and all of tracks 4, 5, and 6.

Now look at Fig. 4 where system files on the same disk are identified. Note track 17, where you find both granules identified with the letter D. Below that you see that D stands for Dir/SYS, the disk directory. Granule 1 of track zero is coded with an A, occupied by Boot/SYS. The unidentified solid lines contain the user files identified in Fig. 2.

All Files Option

This option requests identification of all files. No unidentified granules are shown (see Fig. 5).

Additional Details

With the map on the screen, there isn't enough room to display all the file names simultaneously. Underneath the map, on video line 16, is another menu (see Figs. 2-5). Option F, Filespec, displays the file names—they stay on the screen as long as you keep the F key depressed. When you release the key, the space map returns. Another option, H, Hardcopy, produces a printout of both the map and its file names. If you want to map another disk, type N, return to the main menu and read the new directory. If you don't want to read a new directory, type R, bypass the directory-read, and reuse the directory currently in memory. To end the program, type E. See the Program Listing for Spacemap's program flow.

Disk Directory

The disk directory occupies all 10 sectors of track 17. Sector zero contains two tables. The first one is the granule allocation table (GAT), the second one the lockout table. There is a byte in these tables for each possible track, and this byte describes the status of that track. Consider the lockout table first. If, for example, the tenth byte, describing track 9, doesn't equal FC hex, this track is locked out and unusable.

In the granule allocation table, a byte may indicate that both of its granules are free if it is FC hex, or that both granules are allocated if it is FF hex. If the first granule is allocated and

TRSDOS 09/26/81		S P A C E M A P															
TRACK		G-1	G-2	G-1	G-2	G-1	G-2	G-1	G-2	G-1	G-2	G-1	G-2	G-1	G-2	G-1	G-2
00-03																	
04-07																	
08-11		C	C														
12-15		....	....												
16-19																	
20-23																	
24-27		H	F														
28-31		G	G														
32-35		D	D														
36-39		N/A	N/A														

TYPE: F=FILESPEC'S. H=HARDCOPY. N=NEXT DISK. R=SAME DISK. E=END.

A=SPACEMAP/CMD B=FILELOC/CMD C=TEST1A/CMD D=TEST2/BAS
E=GETDISK/BAS F=DISKDUMP/BAS G=GETTAPE/BAS H=TAPEDISK/CMD

Figure 3. The space map of a 35-track disk. Note the entry for (granules) Not Available.

WORKDISK 09/25/81		S P A C E M A P															
TRACK		G-1	G-2	G-1	G-2	G-1	G-2	G-1	G-2	G-1	G-2	G-1	G-2	G-1	G-2	G-1	G-2
00-03		A	F	F	F												
04-07																	
08-11																	
12-15		C	E	I	M	C	C	C	C	C	C	C	C	C	C	C	C
16-19		H	J	D	D	O	Q	L	G	K	N	B	B	B	B	B	B
20-23		B	B	B	P												
24-27																	
28-31																	
32-35																	
36-39																	

TYPE: F=FILESPEC'S. H=HARDCOPY. N=NEXT DISK. R=SAME DISK. E=END.

A=BOOT/SYS B=SYSE/SYS C=BASIC/CMD D=DIR/SYS
E=SYS7/SYS F=SYS0/SYS G=SYSB/SYS H=SYS1/SYS
I=SYS9/SYS J=SYS2/SYS K=SYS10/SYS L=SYS3/SYS
M=SYS11/SYS N=SYS4/SYS O=SYS12/SYS P=SYS5/SYS
Q=SYS13/SYS

Figure 4. An example space map of system files.

WORKDISK 09/26/81		S P A C E M A P															
TRACK		G-1	G-2	G-1	G-2	G-1	G-2	G-1	G-2	G-1	G-2	G-1	G-2	G-1	G-2	G-1	G-2
00-03		A	H	H	H	M	M	M	M	M	V						
04-07		V	V	V	V	V	V	V	V	M	M	M	M	M	M	M	M
08-11		M	M	M	M	M	M	C	C	C	C	C	C	C	C	C	C
12-15		C	E	L	R	S	U	O	R	O	R	O	R	O	R	O	R
16-19		K	N	D	D	P	I	M	M	M	M	M	M	M	M	M	M
20-23		B	B	B	T	M	M	G	G	G	G	G	G	G	G	G	G
24-27		M	M	G	G	G	G	J	J	J	J	J	J	J	J	J	J
28-31		G	G	G	G	M	M	G	G	M	M	M	M	M	M	M	M
32-35		J	M	M	F	F	....	....	....	....	....	....	....	....	....	....	....
36-39		M	F	....	....	....	....	....	....	....	....	....	....	....	....	....	....

TYPE: F=FILESPEC'S. H=HARDCOPY. N=NEXT DISK. R=SAME DISK. E=END.

A=BOOT/SYS B=SYSE/SYS C=BASIC/CMD D=DIR/SYS
E=SYS7/SYS F=SPACEMAP/CMD G=FILELOC/SRC H=SYS0/SYS
I=SYS8/SYS J=FILELOC/CMD K=SYS1/SYS L=SYS9/SYS
M=SPACEMAP/SRC N=SYS2/SYS O=SYS10/SYS P=SYS3/SYS
Q=SYS11/SYS R=SYS4/SYS S=SYS12/SYS T=SYS5/SYS
U=SYS13/SYS V=EDTASM/CMD

Figure 5. A space map identifying all granules.

Program Listing. The Spacemap program with line comments.

```

00010 ; * * * * * S P A C E M A P * * * * *
00020 ; . . . . .
00030 : EQUATES
3C00 00040 VIDEO EQU 3C00H ;START OF SCREEN
033A 00050 CHSCR EQU 033AN ;PRINT CHAR ON SCREEN
003B 00060 CHPRNT EQU 003BH ;PRINT CHAR ON PRINTER
01C9 00070 CLS EQU 01C9H ;CLEAR VIDEO SCREEN
057C 00080 PRTCCLS EQU 057CH ;CLEAR SCREEN PARTIALLY
402D 00090 DOS EQU 402DH ;DOS ENTRY POINT
0060 00100 DLAY EQU 0060H ;ROM DELAY ROUTINE
4020 00110 CURSOR EQU 4020H ;CURSOR ADDRESS
37E1 00120 SELREG EQU 37E1H ;DISK CONTROLLER SEL REG
37EE 00130 DATREG EQU 37EEH ;DATA REGISTER
37EC 00140 CMDREG EQU 37ECH ;COMMAND REG
37EF 00150 BYTREG EQU 37EFH ;BYTE REGISTER
00160 : . . . .
7000 00170 ORG 7000H ;START OF PROGRAM
7000 3100A0 00180 START LD SP,0A000H ;ADDR FOR STACK POINTER
7003 CDC901 00190 CALL CLS ;CLEAR SCREEN
7006 3E17 00200 LD A,17H ;SET SCREEN UP FOR
7008 CD3A03 00210 CALL CHSCR ;WIDE LETTERS (32 CH)
7008 211378 00220 LD HL,MSG6 ;TITLE
7008 11463C 00230 LD DE,VIDEO+78 ;OF
7011 012C00 00240 LD BC,44 ;PROGRAM
7014 EDB0 00250 LDIR ;AND
7016 21DD77 00260 LD HL,MSG3 ;MY NAME
7019 11983D 00270 LD DE,VIDEO+408 ;AND
701C 010600 00280 LD BC,6 ;CALL
701E EDB0 00290 LDIR ;TO
7021 21E377 00300 LD HL,MSG4 ;VIDEO
7024 110A3E 00310 LD DE,VIDEO+522 ;SCREEN
7027 012680 00320 LD BC,38 ;BE
702A EDB0 00330 LDIR ;ADMIRE
702C 210978 00340 LD HL,MSG5 ;FOR
702F 11963E 00350 LD DE,VIDEO+662 ;A
7032 010A00 00360 LD BC,10 ;WHILE.
7035 EDB0 00370 LDIR ;SINGLE QUOTE
7037 3E27 00380 LD A,27H ;TO 2
7039 32AD77 00390 LD (MSG2+16),A ;MESSAGES
703C 325279 00400 LD (MSG15+28),A ;FILL THE
703F 3E20 00410 LD A, ' ' ;SCREEN DISPLAY
7041 327483 00420 LD (SCRPAT),A ;PATTERN
7044 217483 00430 LD HL,SCRPAT ;AREA
7047 117583 00440 LD DE,SCRPAT+1 ;WITH
704A 010004 00450 LD BC,1024 ;BLANKS.
704D EDB0 00460 LDIR ;MESSAGES TO GO
704F 213679 00470 LD HL,MSG15 ;TO
7052 11B683 00480 LD DE,SCRPAT+66 ;VIDEO
7055 013C00 00490 LD BC,60 ;LINE 2
7058 EDB0 00500 LDIR ;AND
705A 217279 00510 LD HL,MSG16 ;TO
705D 113684 00520 LD DE,SCRPAT+194 ;VIDEO LINE 4
7060 013B00 00530 LD BC,59 ;5 AT A TIME
7063 EDB0 00540 LDIR ;ADD
7065 3EPA 00550 LD A,10 ;FROM HERE
7067 21337A 00560 LD DE,SCRPAT+258 ;TO THERE
706A 117684 00570 LD BC,5 ;ALL 10 LINES DONE ?
706D 010500 A00 00580 LDIR ;IF NOT, CONTINUE
7070 EDB0 00590 EX DE,HL ;GRAPHIC BLOCKS
7072 EB 00600 LD BC,59 ;ALSO
7073 013B00 00610 LD ADD HL,BC ;TO
7076 09 00620 LD DE,HL ;DESTINATION.
7077 EB 00630 EX DE,HL ;ALL 10 LINES DONE ?
7078 3D 00640 DEC A ;GRAPHIC BLOCKS
7079 20F2 00650 JR NZ,A00 ;ALSO
707B 3E83 00660 LD A,131 ;TO
707D 217483 00670 LD HL,SCRPAT ;VIDEO
7080 77 00680 LD (HL),A ;LINE
7081 117583 00690 LD DE,SCRPAT+1 ;LINE
7084 013F00 00700 LD BC,63 ;# 1
7087 EDB0 00710 LDIR ;AND
7089 21F483 00720 LD HL,SCRPAT+128 ;BLOCKS
708C 11F583 00730 LD DE,SCRPAT+129 ;TO
708E 013F00 00740 LD BC,63 ;VIDEO
7092 77 00750 LD (HL),A ;LINE
7093 EDB0 00760 LDIR ;# 3
7095 3E8C 00770 LD A,148 ;BLOCKS
7097 21F486 00780 LD HL,SCRPAT+896 ;TO
709A 11F586 00790 LD DE,SCRPAT+897 ;VIDEO
709D 013F00 00800 LD BC,63 ;LINE
70A0 77 00810 LD (HL),A ;#
70A1 EDB0 00820 LDIR ;15
70A3 3EBF 00830 LD - A,191 ;FILL
70A5 327483 00840 LD (SCRPAT),A ;IN
70A8 32B383 00850 LD (SCRPAT+63),A ;1ST AND LAST
70AB 32B483 00860 LD (SCRPAT+64),A ;POSITIONS
70A8 32B383 00870 LD (SCRPAT+127),A ;OF
70B1 32F483 00880 LD (SCRPAT+128),A ;LINES
70B4 323384 00890 LD (SCRPAT+191),A ;1, 2, 3
70B7 060B 00890 LD B,11 ;GRAPHIC BLOCKS
70B9 DD213484 00910 LD IX,SCRPAT+192 ;BUILD
70BD 114000 00920 LD DE,64 ;VERTICAL
70C0 3EBF 00930 A01 LD A,191 ;LINES
70C2 DD7700 00940 LD (IX),A ;WITHIN
70C5 DD7715 00950 LD (IX+21),A ;THE
70C8 DD7723 00960 LD (IX+35),A ;FRAME
70CB DD7731 00970 LD (IX+49),A ;FOR
70CE DD773F 00980 LD (IX+63),A ;SCREEN
70D1 3E95 00990 LD A,149 ;LINES
70D3 DD7708 01000 LD (IX+8),A ;4
70D6 DD19 01010 ADD IX,DE ;TO 14
70D8 10F6 01020 DJNZ A01 ;CONT IF NOT DONE
70DA 3E97 01030 LD A,151 ;FILL IN
70DC 32C83 01040 LD (SCRPAT+136),A ;MISSED SPOTS
70DF 3EBF 01050 LD A,191 ;IN

```

Listing continued

the second one is free, the code is FD hex; if the first granule is free and the second allocated, the code is FE hex. Sector zero also contains the disk name and the date the disk was created. My program does not use some information.

Sector 1, which contains hash codes, is not used either. The last eight sectors, sectors 2-9, each contain eight file directory entries. These are 32 bytes long and describe a file.

There are two types of file directory entries, the primary entry and the extension entry. The primary entry (FPDE) contains in its first byte a code that indicates whether or not the file exists, whether it is a visible or an invisible file, whether it is a systems or non-systems file, and the file protect code. It also indicates that this is a primary directory entry. The entry contains the 8-byte file name, the 3-byte extension (if any), and some end-of-file information. There are also five 2-byte pairs specifying extents.

The first byte is the track number where the file starts, and the second byte indicates whether this file starts with granule 1 or 2 of this track. It also indicates the number of contiguous granules covered. If there aren't enough contiguous granules to store the file, the next 2-byte pair indicates where the file continues. If the entire file is allocated, the first byte of the next 2-byte pair contains FF hex.

If, however, four of these 2-byte pairs are used and more file space is required, then the first byte of the fifth 2-byte pair contains the code FE hex. In this case its second byte points to the location of a File Extension Directory Entry (FXDE). This entry looks very much like a primary entry but is identified as FXDE in byte 1. It also has five 2-byte pairs, specifying more extents. The program prepares the space map using this information.

Now some comments on the program. A look at the flowchart shows that, after the title display, a screen pattern builds in memory. This is the framework for the

6171	CP	191
6172	JR	Z,A52A
6173	CP	149
6174	JR	Z,A52A
6175	CP	128
6176	JR	C,A52B
6177	LD	A,'*'!
6178	JR	A52B
6179 A52A	LD	A,'!'!
6180 A52B	CALL	CHPRNT

Figure 6. If your printer doesn't print block graphics, make these changes in the Program Listing.



THE MICRO COMPUTER BUSINESS WILL GROW FROM \$10 TO \$100 BILLION IN THE NEXT EIGHT YEARS! ARE YOU READY TO CASH IN?

The micro computer business is predicted to grow from its present \$10 billion to \$100 billion before 1990! Imagine the possibilities this opens for you! No matter where you live, if you're starting up or presently in business, no other industry offers you more opportunity!

Now, finally, all the inside information you need to secure a prosperous future in this dynamic industry is available in one place - **THE COMPUTER ENTREPRENEUR MANUAL**! - An immense information source, compiled by our inquisitive research team, aided by a panel of experts and business people from all areas of the computer industry!

We present the inside story of more than 100 lucrative computer businesses you can enter, where you'll find the real opportunities for the eighties: from one man operations like Programming Author, Word Processing Center or Consulting, to Systems House, Service Bureau, Computer Store etc! Many at little or no investment! All the invaluable facts and figures: How to start, Capital needs, Profit estimates and Margins, How to Sell and Market, How missing technical or business experience need not stand in your way, Source of Suppliers, etc! Details that could take years to find out on your own!

We'll show you inside tricks, like how to never again pay retail for computer products and consumer electronics, even for one item - right now, while you're starting your business! How to get free merchandise and trade show invitations, etc. This alone will more than pay for the manual! You'll read actual case histories of other computer entrepreneurs, so you can learn from their mistakes, and profit from their success stories! Where you'll be one year from now depends on your actions today! Let us show you how to take the first crucial steps!

Order now and take advantage of our limited introduction special, **THE COMPUTER ENTREPRENEUR MANUAL**, and a six month subscription to **THE COMPUTER ENTREPRENEUR REPORT/NEWSLETTER** (so you're always up-to-date with the industry), both for only \$29.95! You must be convinced on how easy you can strike it rich in the micro computer business - or you may return the manual for a full refund within thirty days! **USE OUR TOLL FREE NUMBER TO ORDER!**



EVERYTHING YOU NEED TO KNOW TO SUCCEED IN THE COMPUTER BUSINESS IS ALL IN THIS MANUAL!

THE COMPUTER ENTREPRENEUR MANUAL has the answers to all your questions about selecting, starting and successfully running a computer business! There has never been such a comprehensive collection of know-how and information about this business in one place! All the facts you need to plan and achieve your goals in easy-to-follow, step-by-step instructions!

These are some of the 100-plus businesses covered in **PART ONE** of the manual, with the facts on How to start and run, Start-up Cost (Even how to operate on a shoestring!), What profits to expect, Wholesale prices, Mark-ups, Suppliers, future outlook, case histories for each, etc:

Systems House, Software Author (who to sell to and who to avoid), Service Bureau, Software Publisher (How to find programs that sell), Word Processing Service, Consulting and Consultant Broker (use your skills or those of others, make \$150 - \$1000 a day!), The incredible Game Business, Computer Store (Franchises, Pro and Contra, or a low inventory store in your home!), OEM, Hardware Mfg., Data base and Teletext Service (big prospects!), Used Computers, Repairs, Rent-A-Computer, Promote Fests and Trade Shows, Turnkey Systems,

Bartering, Mail Order, Compile and rent mailing lists, Specialized Data Headhunting and Temp Help Service, Tech Writer Shop, Custom Engineering, The highly profitable Seminars and Training Business, and many more!

Many new ideas and ground floor opportunities! Interviews and success stories on companies of all sizes! Privy info on the profits made: How some computer store operators net \$100 - \$250,000! Little known outlets that made their owners millionaires, one of these low-key companies, making simple boards, went from nil to \$20,000,000 and 100 employees in four years! Programmers that make \$300,000, Thousands of micro millionaires in the making, etc!

Whatever your goal is - Silicon Valley Tycoon, or just a business at home - we guarantee you'll find a business to suit you - or your money back!

PART TWO of the manual is loaded with the know-how and "streetfighting" savvy you need, both as a novice or business veteran, to get started, to stay and to prosper in the micro computer business! A goldmine of information in clear and easy-to-use instructions: How to prepare your Business Plan, Outside financing, The mistakes you must avoid, How to hire and manage employees, Incorporation (when, and how to do it cheaply), Surviving bad times, Record Keeping, how to estimate your market before you start, Use multiple locations to maximize profits, how to promote and stay steps ahead of the competition! How to get free advertising, free merchandise, free advice, Power negotiating with suppliers to double your profit margins, etc! Even how to keep a present job while starting a business part time!

Don't miss this opportunity to be part of this great industry - the next success story could be your own! Order the manual today! Part one and two, bound in a deluxe ring binder, where you can also collect our newsletter (free for six months with the manual - a \$32.50 value!) - all for only \$29.95!



THE COMPUTER ENTREPRENEUR NEWSLETTER - ALL THE LATEST INSIDE BUSINESS NEWS! NOW! SIX MONTHS FREE WITH YOUR MANUAL!

You're always attuned to the industry, and your manual kept up-to-date, with our newsletter! Each issue has the latest business news, ideas, new suppliers, our indispensable "watchdog" column on profits, discounts (don't miss big promos, like recently, when top video monitor sold at \$80 - that's half wholesale, one third of the retail price!), the competition, the big deals, etc! Feature stories with start-up info and case histories on new micro businesses!

You'll get invitations to trade shows and conventions, the usage of our advisory service and our discount buying service for your purchases!

You'll find many items in our newsletter that will save you the cost of your manual many times over!



CALL TOLL FREE!

CHARGE IT!

Credit Card Orders
(MC, VISA only)

accepted 24 hours/day

1-800-227-3800

Ask for extension 1135



Order by phone (Credit cards only), or use the coupon:

- 549



Mail to **THE COMPUTER ENTREPRENEUR PUBLISHING CO.**,
PO BOX 456, Grand Central Station, New York, N.Y. 10163
Please send me **THE COMPUTER ENTREPRENEUR
MANUAL**, and the six month free subscription to
THE COMPUTER ENTREPRENEUR REPORT/NEWSLETTER.
All for only \$29.95, plus \$3 for postage/handling (NY residents: add \$2.64 for sales tax). If I decide not to keep the manual, I may return it within 30 days for a full refund..

NAME: _____

ADDRESS: _____

CITY, STATE, ZIP: _____

Check or M.O. enclosed Charge to VISA MC

CARD# _____

EXP. DATE: _____

SIGNATURE: _____

TR0983

Listing continued

```

70E1 32B994 01960 LD (SCRPAT+149),A ;VIDEO
70E4 321784 01978 LD (SCRPAT+163),A ;LINE
70E7 322584 01988 LD (SCRPAT+177),A ;3
70E8 3E8F 01998 LD A,143 ;AND
70EC 32B987 01100 LD (SCRPAT+917),A ;ALSO
70EE 321787 01110 LD (SCRPAT+931),A ;IN
70F2 322587 01120 LD (SCRPAT+945),A ;VIDEO
70F5 323387 01130 LD (SCRPAT+959),A ;LINE
70F8 32F486 01140 LD (SCRPAT+896),A ;15
70FB 3E8D 01150 LD A,141 ;
70FD 32FC86 01160 LD (SCRPAT+904),A ;
7100 218A77 01170 LD HL,MSG1+31 ;TITLE
7103 110883 01180 LD DE,SCRPAT+23 ;OVER
7106 011000 01190 LD BC,17 ;GRAPHICS
7109 EDB8 01200 LD ;IN LINE 1
710B 219D77 01210 LD BL,MSG2 ;MENU
710E 113487 01220 LD DE,SCRPAT+960 ;MSG
7111 014000 01230 LD BC,64 ;TO
7114 EDB8 01240 LD DIR ;LINE 16
7116 3E52 01250 LD A,'R' ;READ/NOREAD INDIC
7118 32C779 01260 LD (RDIND),A ;TO READ
711B 060E 01270 LD B,14 ;WAIT
711D CD1376 01280 CALL WAIT ;A WHILE
7120 3E1C 01290 LD A,1CH ;RESTORE
7122 CD3A03 01300 CALL CBSR ;REC SIZE SCREEN
7125 CDC981 01310 A01A CALL CLS ;CLEAR SCREEN
7128 3E83 01320 LD A,131 ;BUILD
712A 21803C 01330 LD HL,VIDEO ;GRAPHIC
712D 11013C 01340 LD DE,VIDEO+1 ;FRAME
7130 013F00 01350 LD BC,63 ;FOR
7133 77 01360 LD (BL),A ;THE
7134 EDB8 01370 LD DIR ;MENU
7136 21803F 01380 LD BL,VIDEO+896 ;LINES 1
7139 11013P 01390 LD DB,VIDEO+897 ;AND
713C 013F00 01400 LD BC,63 ;16
713F 77 01410 LD (BL),A
7140 EDB8 01420 LD DIR
7142 216877 01430 LD HL,MSG1 ;TITLE
7145 11773C 01440 LD DE,VIDEO+119 ;TO
7148 013100 01450 LD BC,49 ;MENU LINE 3
714B EDB8 01460 LD DIR
714D 3AC779 01470 LD A,(RDIND) ;WHICH
7150 PE52 01480 LD 'R' ;MSG
7152 2808 01490 LD JR Z,A02 ;INSERT DISK
7154 21E778 01500 LD BL,MSG13 ;USING
7157 01248B 01510 LD BC,36 ;DIRECTORY
7158 1806 01520 LD A03 ;IN MEM MSG
715C 214378 01530 A02 LD HL,MSG7 ;INSERT NEXT
715F 013C08 01540 LD BC,69 ;DISK MSG
7162 11003D 01550 A03 LD DE,VIDEO+256 ;MOVE IT TO
7165 EDB8 01560 LD DIR ;LINE 5
7167 217F78 01570 LD HL,MSG8 ;SHOW FILENAMES MSG
716A 11003D 01580 LD DE,VIDEO+384 ;TO
716D 011300 01590 LD BC,19 ;LINE
7170 EDB8 01600 LD ;7
7172 219278 01610 LD HL,MSG9 ;VIS USER FILES
7175 11D23D 01620 LD DE,VIDEO+466 ;MSG
7178 011000 01630 LD BC,38 ;TO
717B EDB8 01640 LD DIR ;LINE 8
717D 218878 01650 LD BL,MSG19 ;SYSTEMS FILES
7180 11123E 01660 LD DE,VIDEO+538 ;MSG
7183 012788 01670 LD BC,39 ;TO
7186 EDB8 01680 LD DIR ;LINE 9
7188 21D778 01690 LD BL,MSG11 ;ALL FILES
718B 11523E 01700 LD DE,VIDEO+594 ;MSG
718E 011000 01710 LD BC,16 ;TO
7191 EDB8 01720 LD DIR ;LINE 18
7193 210879 01730 LD BL,MSG12 ;OR-END
7196 11CB3E 01740 LD DE,VIDEO+715 ;MSG
7199 011E00 01750 LD BC,30 ;TO
719C EDB8 01760 LD DIR ;LINE 12
719B 3E55 01770 A04 LD A,'U' ;MOVE
71A0 32D33D 01780 LD (VIDEO+467),A ;LETTERS OF
71A3 3E53 01790 LD A,'S' ;THE MENU
71A5 32133E 01800 LD (VIDEO+531),A ;OPTIONS
71A8 3E41 01810 LD A,'A' ;IN
71AA 32533E 01820 LD (VIDEO+595),A ;THE
71AD 3E45 01830 LD A,'E' ;MENU
71AF 32D33E 01840 LD (VIDEO+723),A ;MESSAGES
71B2 218011 01850 LD BL,1108H ;INIT LOOP CTR
71B5 CD8F76 01860 CALL SCANKB ;CHECK KEYBOARD INPUT
71B8 FE80 01870 CP 0 ;ANYTHING TYPED ?
71B8 2818 01880 JR NZ,A05 ;YES, CBECK WHAT
71BC 3E8F 01890 LD A,8FH ;NOTHING TYPED
71BE 32D33D 01900 LD (VIDEO+467),A ;PUT GRAPHIC BLOCKS
71C1 32133E 01910 LD (VIDEO+531),A ;OVER THE
71C4 32533E 01920 LD (VIDEO+595),A ;MENU
71C7 32D33E 01930 LD (VIDEO+723),A ;OPTIONS
71CA 210809 01940 LD BL,98H ;INIT LOOP CTR
71CD CD8F76 01950 CALL SCANKB ;CHECK FOR KB INPT
71DB FE80 01960 CP 0 ;ANYTHING ?
71D2 28CA 01970 JR Z,A04 ;NO, REPEAT CHECK
71D4 32C879 01980 A05 LD (KBIND),A ;SAVE KEYBOARD ENTRY
71D7 FE53 01990 CP 'S' ;SYSTEMS FILES ?
71D9 2815 02000 JR Z,A06A ;YES
71DB FE55 02010 CP 'U' ;USER FILES ?
71DD 2811 02020 JR Z,A06A ;YES
71DE FE41 02030 CP 'A' ;ALL FILES ?
71E1 280D 02040 JR Z,A06A ;YES
71E3 FE45 02050 CP 'E' ;END PROGRAM ?
71E5 2087 02060 JR NZ,A04 ;NO, INVALID BMTRY
71E7 21083F 02070 A06 LD HL,VIDEO+896 ;CURSOR ADDRESS
71EA 222849 02080 LD (CURSOR),BL ;TO LINE 15
71ED CD2D49 02090 CALL DOS ;EXIT TO DOS (END PGM)
71F0 3AC779 02100 A06A LD A,(RDIND) ;HAVE TO

```

Listing continued

map and, once built, is used for all maps. After the directory is read or ignored, depending on the read switch setting, a granule table is built in memory. This table is 80 bytes long, each byte representing one granule for a 40-track disk. The table is filled with 50 hex, 51 hex, or 52 hex, depending on the information found in the GAT and lockout table.

After this table is complete, the program checks sectors 2-9 for files, keyed to the map by name. The files checked depend on the option taken earlier when you answered the query for file names. A file code counter is started and incremented for each file you use. This code is then inserted into the granule table in the granules where the file resides. Later, this code converts to the more convenient A-Z, 1-9, 10 and up configuration for display purposes. The file name area is built showing these codes and their associated file names.

After a check of sectors 2-9 is complete, the now-updated granule table is decoded and a screen display pattern is built. The display pattern then moves to the screen memory. Pressing the F key replaces it with the keyed file names. When you release F, the display pattern moves back to video. This happens very quickly. You get a printout by sending data bytes to the printer ROM routine from the map area, followed by the file name area. In order to center the output, eight blanks precede each line. Find more detailed comments in the program listing.

A careful look at the map shows whether a file is badly fragmented or not. Fragmentation depends upon the number of contiguous granules available to the system when a file is saved. Single-drive owners see how many systems files have to be carried on each disk.

Spacemap is handy, especially when mapping disks with different operating systems, or data disks without the systems programs. The program produces a map as long as the directory criteria are the same.

Modifications

I own the Microline-80 printer, and the CR/LF code for is 0A hex. If your printer requires a different code, change line 8110 in the Program Listing. If your printer doesn't print block graphics, make the changes listed in Fig. 6; they should produce acceptable graphics. ■

Write to Hubert C. Borrmann at Star Route Box 3450, Lillian, AL 36549.



WORD GRAPHICS DATA PROCESSOR

CopyArt II has earned the "Professional Software Programmers Association's Recommended Seal of Approval"

Certification #1633

- Columns
- Sorting
- Graphics
- Math
- Graphic Characters
- Justify/Proportional
- Super/Sub Script
- Underlining
- Change Character Size or Pitch Easily!
- Help Command
- Electric Webster Integration
- Headers/Footers
- Page Numbering
- Edit Basic Programs

- DOS Commands Like Dir, Kill & Free
- Hi-Res Graphics Supported on Most Printers with Capability
- Free Mail List Program Allows Merging Names with Form Letters
- Scripsit File Loader
- Imbed Printer Control Codes
- Block Move
- Find/Replace with Wildcard and Repeat
- Super Easy Manual & Reference Card!
- Add Graphics Easily!

CUSTOMIZED PRINTER DRIVERS FOR

Radio Shack LP II, V, VI, VIII, DMP2100, DMP100, DMP500, DMP600,
Daisy Wheel II

Epson MX-80, MX-80F/T, MX-100, FX-80 (all with or without Graftrax 80,
Graftrax Plus, or Type III) Smith-Corona Daisy Wheel
Okidata 80, 82A, 83A, 84, 92, 93 Brother HR-1 Daisy Wheel
C. Itoh 8510, 1550, Prowriter Series, Starwriter F-10 series, Printmaster
Others supported. Call if yours is not listed. Printer must have mechanical ability
to do some features.

call toll free:

800-528-1149

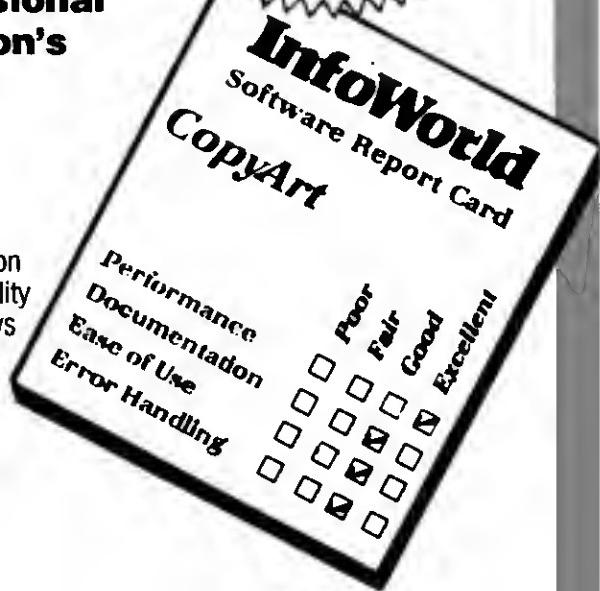


SPECIFY PRINTER WHEN ORDERING

COPYART	149.95
Extra printer drivers	19.95
"ELECTRIC WEBSTER" ..	149.95

Visa/MC/AMEX
Check/COD

Hardware Requirements TRS-80 Mod I, III or IV
48K Memory One Disk Drive/Double Density Two Disk Drives/Single Density



This Report Card was
done for CopyArt
Version One (since
vastly improved to
CopyArt II).

"As a word processor
with integral graphics
capabilities, CopyArt is
fabulous!"

Dan Robinson,
80 MICRO, Sept 82

SIMUTEK

Computer Products Inc.

4897 E. Speedway Tucson, AZ 85712

(602) 323-9391

> 164

Listing continued

Listings continues

Listing continued

```

736C 280B 0355B0          JR      NZ,A21A      NO BLANK CUT THE
736E 2174B 0359A          LD      HL,BLANKS    NO-TILENAMES
7370 DE'FSAREA             LD      DE,BC12
7371 1174B3 0360B          LD      LDR
7372 610C90 0361B          LD      INC
7377 EDBB 0362B          INC
7379 3C 0363B A21A      ADD 1
738A 32D179 0364B          LD      (CODECTR),A
738B CD0677 0365B          LD      CONTRL
738D DD2A9D79 0366B          LD      IX,(FSADDR)
738E 3A727A 0367B          LD      A,(ASCII+1)
738F 2A23 0368B          LD      ASCCI
7390 2A23 0369B          LD      (TX),A
7391 2A23 036A0          LD      TO FILE
7392 2A23 036B0          LD      A,(ASCI+4)
7393 2A23 036C0          LD      SAVE
7394 2A23 036D0          LD      (IX+1),A
7395 2A23 036E0          LD      AREA
7396 2A23 036F0          LD      A,=
7397 2A23 03700          LD      AND AN = SIGN
7398 2A23 03710          LD      TOTD.
7399 2A23 03720          LD      GET
739A 2A23 03730          LD      (HL,(DEADDR))
739B 2A23 03740          LD      BC,5
739C 2A23 03750          LD      ADD
739D 2A23 03760          LD      HL,BC
739E 2A23 03770 A22      LD      B,B
739F 2A23 03780          LD      A,(HL)
7400 2A23 03790          LD      ,,
7401 2A23 037A0          LD      C
7402 2A23 037B0          LD      CP
7403 2A23 037C0          LD      DD7703
7404 2A23 037D0          LD      INC
7405 2A23 037E0          LD      INC
7406 2A23 037F0          LD      INC
7407 2A23 03800          LD      INC
7408 2A23 03810          LD      INC
7409 2A23 03820          LD      INC
740A 2A23 03830          LD      INC
740B 2A23 03840 A23      LD      INC
740C 2A23 03850          LD      INC
740D 2A23 03860          LD      ADD
740E 2A23 03870          LD      A,(BL)
740F 2A23 03880          LD      LD
7410 2A23 03890          LD      CP
7411 2A23 038A0          LD      JR
7412 2A23 038B0          LD      Z,A24
7413 2A23 038C0          LD      (IX+4),A
7414 2A23 038D0          LD      A,/
7415 2A23 038E0          LD      A,SLASH
7416 2A23 038F0          LD      AND
7417 2A23 03900          LD      IS
7418 2A23 03910          LD      THERE ONE ?
7419 2A23 03920          LD      IF NOT, WE'RE DONE
7420 2A23 03930          LD      MOVE
7421 2A23 03940          LD      /A
7422 2A23 03950          LD      /A
7423 2A23 03960          LD      /A
7424 2A23 03970          LD      /TITLE SAVE
7425 2A23 03980          LD      /AREA
7426 2A23 03990          LD      /DEVELDF ADDR
7427 2A23 039A0          LD      /FSADDR
7428 2A23 039B0          LD      /PDR
7429 2A23 039C0          LD      /NEXT
7430 2A23 039D0          LD      /FILENAME
7431 2A23 039E0          LD      /DEVELDF ADDR
7432 2A23 039F0          LD      /DE,1ST OF 5
7433 2A23 03A00          LD      /2-BYTE
7434 2A23 03A10          LD      /EXTENTS
7435 2A23 03A20          LD      /CHECK
7436 2A23 03A30          LD      /BYTE 1 OF 2-BYTE PAIR
7437 2A23 03A40          LD      /ALL EXTENTS DONE ?
7438 2A23 03A50          LD      /YES, GET NEXT DIR ENTRY
7439 2A23 03A60          LD      /MORE EXTS IN EXT-DIR-ENT?
7440 2A23 03A70          LD      /YES, FIND EXT-DIR-ENTRY
7441 2A23 03A80          LD      /LOAD ADDR OF GRAN-TBL
7442 2A23 03A90          LD      HL,GRBL
7443 2A23 03AA0          LD      POP
7444 2A23 03AB0          LD      A,(IX)
7445 2A23 03AC0          LD      ADD
7446 2A23 03AD0          LD      BC,0
7447 2A23 03AE0          LD      C,A
7448 2A23 03AF0          LD      HL,BC+
7449 2A23 03B00          LD      A,(IX+1)
7450 2A23 03B10          LD      (WCTR1),A
7451 2A23 03B20          LD      INC
7452 2A23 03B30          LD      ADD
7453 2A23 03B40          LD      LD
7454 2A23 03B50          LD      POP
7455 2A23 03B60          LD      A,(IX+5),A
7456 2A23 03B70          LD      ADD
7457 2A23 03B80          LD      HL,(DEADDR)
7458 2A23 03B90          LD      BC,16
7459 2A23 03BA0          LD      ADD
7460 2A23 03BB0          LD      INC
7461 2A23 03BC0          LD      ADD
7462 2A23 03BD0          LD      HL
7463 2A23 03BE0          LD      ADD
7464 2A23 03BF0          LD      HL,(FSADDR)
7465 2A23 03C00          LD      ADD
7466 2A23 03C10          LD      HL
7467 2A23 03C20          LD      ADD
7468 2A23 03C30          LD      HL
7469 2A23 03C40          LD      ADD
7470 2A23 03C50          LD      HL
7471 2A23 03C60          LD      ADD
7472 2A23 03C70          LD      HL
7473 2A23 03C80          LD      ADD
7474 2A23 03C90          LD      ADD
7475 2A23 03CA0          LD      HL
7476 2A23 03CB0          LD      ADD
7477 2A23 03CC0          LD      HL
7478 2A23 03CD0          LD      ADD
7479 2A23 03CE0          LD      HL
7480 2A23 03CF0          LD      ADD
7481 2A23 03D00          LD      HL
7482 2A23 03D10          LD      ADD
7483 2A23 03D20          LD      HL
7484 2A23 03D30          LD      ADD
7485 2A23 03D40          LD      HL
7486 2A23 03D50          LD      ADD
7487 2A23 03D60          LD      HL
7488 2A23 03D70          LD      ADD
7489 2A23 03D80          LD      HL
7490 2A23 03D90          LD      ADD
7491 2A23 03DA0          LD      HL
7492 2A23 03DB0          LD      ADD
7493 2A23 03DC0          LD      HL
7494 2A23 03DD0          LD      ADD
7495 2A23 03DE0          LD      HL
7496 2A23 03DF0          LD      ADD
7497 2A23 03E00          LD      HL
7498 2A23 03E10          LD      ADD
7499 2A23 03E20          LD      HL
7500 2A23 03E30          LD      ADD
7501 2A23 03E40          LD      HL
7502 2A23 03E50          LD      ADD
7503 2A23 03E60          LD      HL
7504 2A23 03E70          LD      ADD
7505 2A23 03E80          LD      HL
7506 2A23 03E90          LD      ADD
7507 2A23 03EA0          LD      HL
7508 2A23 03EB0          LD      ADD
7509 2A23 03EC0          LD      HL
7510 2A23 03ED0          LD      ADD
7511 2A23 03EE0          LD      HL
7512 2A23 03EF0          LD      ADD
7513 2A23 03F00          LD      HL
7514 2A23 03F10          LD      ADD
7515 2A23 03F20          LD      HL
7516 2A23 03F30          LD      ADD
7517 2A23 03F40          LD      HL
7518 2A23 03F50          LD      ADD
7519 2A23 03F60          LD      HL
7520 2A23 03F70          LD      ADD
7521 2A23 03F80          LD      HL
7522 2A23 03F90          LD      ADD
7523 2A23 03FA0          LD      HL
7524 2A23 03FB0          LD      ADD
7525 2A23 03FC0          LD      HL
7526 2A23 03FD0          LD      ADD
7527 2A23 03FE0          LD      HL
7528 2A23 03FF0          LD      ADD
7529 2A23 03000          LD      HL
7530 2A23 03010          LD      ADD
7531 2A23 03020          LD      HL
7532 2A23 03030          LD      ADD
7533 2A23 03040          LD      HL
7534 2A23 03050          LD      ADD
7535 2A23 03060          LD      HL
7536 2A23 03070          LD      ADD
7537 2A23 03080          LD      HL
7538 2A23 03090          LD      ADD
7539 2A23 030A0          LD      HL
7540 2A23 030B0          LD      ADD
7541 2A23 030C0          LD      HL
7542 2A23 030D0          LD      ADD
7543 2A23 030E0          LD      HL
7544 2A23 030F0          LD      ADD
7545 2A23 03100          LD      HL
7546 2A23 03110          LD      ADD
7547 2A23 03120          LD      HL
7548 2A23 03130          LD      ADD
7549 2A23 03140          LD      HL
7550 2A23 03150          LD      ADD
7551 2A23 03160          LD      HL
7552 2A23 03170          LD      ADD
7553 2A23 03180          LD      HL
7554 2A23 03190          LD      ADD
7555 2A23 031A0          LD      HL
7556 2A23 031B0          LD      ADD
7557 2A23 031C0          LD      HL
7558 2A23 031D0          LD      ADD
7559 2A23 031E0          LD      HL
7560 2A23 031F0          LD      ADD
7561 2A23 03200          LD      HL
7562 2A23 03210          LD      ADD
7563 2A23 03220          LD      HL
7564 2A23 03230          LD      ADD
7565 2A23 03240          LD      HL
7566 2A23 03250          LD      ADD
7567 2A23 03260          LD      HL
7568 2A23 03270          LD      ADD
7569 2A23 03280          LD      HL
7570 2A23 03290          LD      ADD
7571 2A23 032A0          LD      HL
7572 2A23 032B0          LD      ADD
7573 2A23 032C0          LD      HL
7574 2A23 032D0          LD      ADD
7575 2A23 032E0          LD      HL
7576 2A23 032F0          LD      ADD
7577 2A23 03300          LD      HL
7578 2A23 03310          LD      ADD
7579 2A23 03320          LD      HL
7580 2A23 03330          LD      ADD
7581 2A23 03340          LD      HL
7582 2A23 03350          LD      ADD
7583 2A23 03360          LD      HL
7584 2A23 03370          LD      ADD
7585 2A23 03380          LD      HL
7586 2A23 03390          LD      ADD
7587 2A23 033A0          LD      HL
7588 2A23 033B0          LD      ADD
7589 2A23 033C0          LD      HL
7590 2A23 033D0          LD      ADD
7591 2A23 033E0          LD      HL
7592 2A23 033F0          LD      ADD
7593 2A23 03400          LD      HL
7594 2A23 03410          LD      ADD
7595 2A23 03420          LD      HL
7596 2A23 03430          LD      ADD
7597 2A23 03440          LD      HL
7598 2A23 03450          LD      ADD
7599 2A23 03460          LD      HL
7600 2A23 03470          LD      ADD
7601 2A23 03480          LD      HL
7602 2A23 03490          LD      ADD
7603 2A23 034A0          LD      HL
7604 2A23 034B0          LD      ADD
7605 2A23 034C0          LD      HL
7606 2A23 034D0          LD      ADD
7607 2A23 034E0          LD      HL
7608 2A23 034F0          LD      ADD
7609 2A23 03500          LD      HL
7610 2A23 03510          LD      ADD
7611 2A23 03520          LD      HL
7612 2A23 03530          LD      ADD
7613 2A23 03540          LD      HL
7614 2A23 03550          LD      ADD
7615 2A23 03560          LD      HL
7616 2A23 03570          LD      ADD
7617 2A23 03580          LD      HL
7618 2A23 03590          LD      ADD
7619 2A23 035A0          LD      HL
7620 2A23 035B0          LD      ADD
7621 2A23 035C0          LD      HL
7622 2A23 035D0          LD      ADD
7623 2A23 035E0          LD      HL
7624 2A23 035F0          LD      ADD
7625 2A23 03600          LD      HL
7626 2A23 03610          LD      ADD
7627 2A23 03620          LD      HL
7628 2A23 03630          LD      ADD
7629 2A23 03640          LD      HL
7630 2A23 03650          LD      ADD
7631 2A23 03660          LD      HL
7632 2A23 03670          LD      ADD
7633 2A23 03680          LD      HL
7634 2A23 03690          LD      ADD
7635 2A23 036A0          LD      HL
7636 2A23 036B0          LD      ADD
7637 2A23 036C0          LD      HL
7638 2A23 036D0          LD      ADD
7639 2A23 036E0          LD      HL
7640 2A23 036F0          LD      ADD
7641 2A23 03700          LD      HL
7642 2A23 03710          LD      ADD
7643 2A23 03720          LD      HL
7644 2A23 03730          LD      ADD
7645 2A23 03740          LD      HL
7646 2A23 03750          LD      ADD
7647 2A23 03760          LD      HL
7648 2A23 03770          LD      ADD
7649 2A23 03780          LD      HL
7650 2A23 03790          LD      ADD
7651 2A23 037A0          LD      HL
7652 2A23 037B0          LD      ADD
7653 2A23 037C0          LD      HL
7654 2A23 037D0          LD      ADD
7655 2A23 037E0          LD      HL
7656 2A23 037F0          LD      ADD
7657 2A23 03800          LD      HL
7658 2A23 03810          LD      ADD
7659 2A23 03820          LD      HL
7660 2A23 03830          LD      ADD
7661 2A23 03840          LD      HL
7662 2A23 03850          LD      ADD
7663 2A23 03860          LD      HL
7664 2A23 03870          LD      ADD
7665 2A23 03880          LD      HL
7666 2A23 03890          LD      ADD
7667 2A23 038A0          LD      HL
7668 2A23 038B0          LD      ADD
7669 2A23 038C0          LD      HL
7670 2A23 038D0          LD      ADD
7671 2A23 038E0          LD      HL
7672 2A23 038F0          LD      ADD
7673 2A23 03900          LD      HL
7674 2A23 03910          LD      ADD
7675 2A23 03920          LD      HL
7676 2A23 03930          LD      ADD
7677 2A23 03940          LD      HL
7678 2A23 03950          LD      ADD
7679 2A23 03960          LD      HL
7680 2A23 03970          LD      ADD
7681 2A23 03980          LD      HL
7682 2A23 03990          LD      ADD
7683 2A23 039A0          LD      HL
7684 2A23 039B0          LD      ADD
7685 2A23 039C0          LD      HL
7686 2A23 039D0          LD      ADD
7687 2A23 039E0          LD      HL
7688 2A23 039F0          LD      ADD
7689 2A23 03A00          LD      HL
7690 2A23 03A10          LD      ADD
7691 2A23 03A20          LD      HL
7692 2A23 03A30          LD      ADD
7693 2A23 03A40          LD      HL
7694 2A23 03A50          LD      ADD
7695 2A23 03A60          LD      HL
7696 2A23 03A70          LD      ADD
7697 2A23 03A80          LD      HL
7698 2A23 03A90          LD      ADD
7699 2A23 03A90          LD      HL
7700 2A23 03A90          LD      ADD
7701 2A23 03A90          LD      HL
7702 2A23 03A90          LD      ADD
7703 2A23 03A90          LD      HL
7704 2A23 03A90          LD      ADD
7705 2A23 03A90          LD      HL
7706 2A23 03A90          LD      ADD
7707 2A23 03A90          LD      HL
7708 2A23 03A90          LD      ADD
7709 2A23 03A90          LD      HL
7710 2A23 03A90          LD      ADD
7711 2A23 03A90          LD      HL
7712 2A23 03A90          LD      ADD
7713 2A23 03A90          LD      HL
7714 2A23 03A90          LD      ADD
7715 2A23 03A90          LD      HL
7716 2A23 03A90          LD      ADD
7717 2A23 03A90          LD      HL
7718 2A23 03A90          LD      ADD
7719 2A23 03A90          LD      HL
7720 2A23 03A90          LD      ADD
7721 2A23 03A90          LD      HL
7722 2A23 03A90          LD      ADD
7723 2A23 03A90          LD      HL
7724 2A23 03A90          LD      ADD
7725 2A23 03A90          LD      HL
7726 2A23 03A90          LD      ADD
7727 2A23 03A90          LD      HL
7728 2A23 03A90          LD      ADD
7729 2A23 03A90          LD      HL
7730 2A23 03A90          LD      ADD
7731 2A23 03A90          LD      HL
7732 2A23 03A90          LD      ADD
7733 2A23 03A90          LD      HL
7734 2A23 03A90          LD      ADD
7735 2A23 03A90          LD      HL
7736 2A23 03A90          LD      ADD
7737 2A23 03A90          LD      HL
7738 2A23 03A90          LD      ADD
7739 2A23 03A90          LD      HL
7740 2A23 03A90          LD      ADD
7741 2A23 03A90          LD      HL
7742 2A23 03A90          LD      ADD
7743 2A23 03A90          LD      HL
7744 2A23 03A90          LD      ADD
7745 2A23 03A90          LD      HL
7746 2A23 03A90          LD      ADD
7747 2A23 03A90          LD      HL
7748 2A23 03A90          LD      ADD
7749 2A23 03A90          LD      HL
7750 2A23 03A90          LD      ADD
7751 2A23 03A90          LD      HL
7752 2A23 03A90          LD      ADD
7753 2A23 03A90          LD      HL
7754 2A23 03A90          LD      ADD
7755 2A23 03A90          LD      HL
7756 2A23 03A90          LD      ADD
7757 2A23 03A90          LD      HL
7758 2A23 03A90          LD      ADD
7759 2A23 03A90          LD      HL
7760 2A23 03A90          LD      ADD
7761 2A23 03A90          LD      HL
7762 2A23 03A90          LD      ADD
7763 2A23 03A90          LD      HL
7764 2A23 03A90          LD      ADD
7765 2A23 03A90          LD      HL
7766 2A23 03A90          LD      ADD
7767 2A23 03A90          LD      HL
7768 2A23 03A90          LD      ADD
7769 2A23 03A90          LD      HL
7770 2A23 03A90          LD      ADD
7771 2A23 03A90          LD      HL
7772 2A23 03A90          LD      ADD
7773 2A23 03A90          LD      HL
7774 2A23 03A90          LD      ADD
7775 2A23 03A90          LD      HL
7776 2A23 03A90          LD      ADD
7777 2A23 03A90          LD      HL
7778 2A23 03A90          LD      ADD
7779 2A23 03A90          LD      HL
7780 2A23 03A90          LD      ADD
7781 2A23 03A90          LD      HL
7782 2A23 03A90          LD      ADD
7783 2A23 03A90          LD      HL
7784 2A23 03A90          LD      ADD
7785 2A23 03A90          LD      HL
7786 2A23 03A90          LD      ADD
7787 2A23 03A90          LD      HL
7788 2A23 03A90          LD      ADD
7789 2A23 03A90          LD      HL
7790 2A23 03A90          LD      ADD
7791 2A23 03A90          LD      HL
7792 2A23 03A90          LD      ADD
7793 2A23 03A90          LD      HL
7794 2A23 03A90          LD      ADD
7795 2A23 03A90          LD      HL
7796 2A23 03A90          LD      ADD
7797 2A23 03A90          LD      HL
7798 2A23 03A90          LD      ADD
7799 2A23 03A90          LD      HL
7800 2A23 03A90          LD      ADD
7801 2A23 03A90          LD      HL
7802 2A23 03A90          LD      ADD
7803 2A23 03A90          LD      HL
7804 2A23 03A90          LD      ADD
7805 2A23 03A90          LD      HL
7806 2A23 03A90          LD      ADD
7807 2A23 03A90          LD      HL
7808 2A23 03A90          LD      ADD
7809 2A23 03A90          LD      HL
7810 2A23 03A90          LD      ADD
7811 2A23 03A90          LD      HL
7812 2A23 03A90          LD      ADD
7813 2A23 03A90          LD      HL
7814 2A23 03A90          LD      ADD
7815 2A23 03A90          LD      HL
7816 2A23 03A90          LD      ADD
7817 2A23 03A90          LD      HL
7818 2A23 03A90          LD      ADD
7819 2A23 03A90          LD      HL
7820 2A23 03A90          LD      ADD
7821 2A23 03A90          LD      HL
7822 2A23 03A90          LD      ADD
7823 2A23 03A90          LD      HL
7824 2A23 03A90          LD      ADD
7825 2A23 03A90          LD      HL
7826 2A23 03A90          LD      ADD
7827 2A23 03A90          LD      HL
7828 2A23 03A90          LD      ADD
7829 2A23 03A90          LD      HL
7830 2A23 03A90          LD      ADD
7831 2A23 03A90          LD      HL
7832 2A23 03A90          LD      ADD
7833 2A23 03A90          LD      HL
7834 2A23 03A90          LD      ADD
7835 2A23 03A90          LD      HL
7836 2A23 03A90          LD      ADD
7837 2A23 03A90          LD      HL
7838 2A23 03A90          LD      ADD
7839 2A23 03A90          LD      HL
7840 2A23 03A90          LD      ADD
7841 2A23 03A90          LD      HL
7842 2A23 03A90          LD      ADD
7843 2A23 03A90          LD      HL
7844 2A23 03A90          LD      ADD
7845 2A23 03A90          LD      HL
7846 2A23 03A90          LD      ADD
7847 2A23 03A90          LD      HL
7848 2A23 03A90          LD      ADD
7849 2A23 03A90          LD      HL
7850 2A23 03A90          LD      ADD
7851 2A23 03A90          LD      HL
7852 2A23 03A90          LD      ADD
7853 2A23 03A90          LD      HL
7854 2A23 03A90          LD      ADD
7855 2A23 03A90          LD      HL
7856 2A23 03A90          LD      ADD
7857 2A23 03A90          LD      HL
7858 2A23 03A90          LD      ADD
7859 2A23 03A90          LD      HL
7860 2A23 03A90          LD      ADD
7861 2A23 03A90          LD      HL
7862 2A23 03A90          LD      ADD
7863 2A23 03A90          LD      HL
7864 2A23 03A90          LD      ADD
7865 2A23 03A90          LD      HL
7866 2A23 03A90          LD      ADD
7867 2A23 03A90          LD      HL
7868 2A23 03A90          LD      ADD
7869 2A23 03A90          LD      HL
7870 2A23 03A90          LD      ADD
7871 2A23 03A90          LD      HL
7872 2A23 03A90          LD      ADD
7873 2A23 03A90          LD      HL
7874 2A23 03A90          LD      ADD
7875 2A23 03A90          LD      HL
7876 2A23 03A90          LD      ADD
7877 2A23 03A90          LD      HL
7878 2A23 03A90          LD      ADD
7879 2A23 03A90          LD      HL
7880 2A23 03A90          LD      ADD
7881 2A23 03A90          LD      HL
7882 2A23 03A90          LD      ADD
7883 2A23 03A90          LD      HL
7884 2A23 03A90          LD      ADD
7885 2A23 03A90          LD      HL
7886 2A23 03A90          LD      ADD
7887 2A23 03A90          LD      HL
7888 2A23 03A90          LD      ADD
7889 2A23 03A90          LD      HL
7890 2A23 03A90          LD      ADD
7891 2A23 03A90          LD      HL
7892 2A23 03A90          LD      ADD
7893 2A23 03A90          LD      HL
7894 2A23 03A90          LD      ADD
7895 2A23 03A90          LD      HL
7896 2A23 03A90          LD      ADD
7897 2A23 03A90          LD      HL
7898 2A23 03A90          LD      ADD
7899 2A23 03A90          LD      HL
7900 2A23 03A90          LD      ADD
7901 2A23 03A90          LD      HL
7902 2A23 03A90          LD      ADD
7903 2A23 03A90          LD      HL
7904 2A23 03A90          LD      ADD
7905 2A23 03A90          LD      HL
7906 2A23 03A90          LD      ADD
7907 2A23 03A90          LD      HL
7908 2A23 03A90          LD      ADD
7909 2A23 03A90          LD      HL
7910 2A23 03A90          LD      ADD
7911 2A23 03A90          LD      HL
7912 2A23 03A90          LD      ADD
7913 2A23 03A90          LD      HL
7914 2A23 03A90          LD      ADD
7915 2A23 03A90          LD      HL
7916 2A23 03A90          LD      ADD
7917 2A23 03A90          LD      HL
7918 2A23 03A90          LD      ADD
7919 2A23 03A90          LD      HL
7920 2A23 03A90          LD      ADD
7921 2A23 03A90          LD      HL
7922 2A23 03A90          LD      ADD
7923 2A23 03A90          LD      HL
7924 2A23 03A90          LD      ADD
7925 2A23 03A90          LD      HL
7926 2A23 03A90          LD      ADD
7927 2A23 03A90          LD      HL
7928 2A23 03A90          LD      ADD
7929 2A23 03A90          LD      HL
7930 2A23 03A90          LD      ADD
7931 2A23 03A90          LD      HL
7932 2A23 03A90          LD      ADD
7933 2A23 03A90          LD      HL
7934 2A23 03A90          LD      ADD
7935 2A23 03A90          LD      HL
7936 2A23 03A90          LD      ADD
7937 2A23 03A90          LD
```

Listing continued

92 • 80 Micro, September 1983

Losing Control

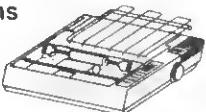


FRICITION FEED FOR YOUR EPSON

MX-70* or MX-80*

*MX-70 and MX-80 are Trademarks of EPSON, Inc.

- Converts your printer for friction feed of SINGLE SHEETS or ROLL PAPER.
- SIMPLE Installation (all you need is a screwdriver, no soldering).
- Tractor feed remains undisturbed.
- Only \$39.95 (add \$2.00 for shipping)



SATISFACTION GUARANTEED OR YOUR MONEY BACK



VISA & Master Card Accepted (714) 864-6643

MICRO-GRIP 161

3164 Dumbarton Ave.
San Bernardino, CA 92404

CALIFORNIA RESIDENT ADD 6% STATE SALES TAX

TRACMASTER™ DATA CASSETTES

C10-\$11.95 doz. C40-\$14.95 doz.
C20-\$12.95 doz. C50-\$15.95 doz.
C30-\$13.95 doz. C60-\$16.95 doz.

INCLUDES HARD NORELCO BOX

Don't pay top dollar for warmed over audio cassettes with poor performance. Tracmaster cassettes are specifically designed for computer applications with a high output, low noise tape, digital pressure pad and large flanged rollers for smooth delivery and superior azimuth tracking.

Cassette duplicating: Mod 1, 3, Color, & Atari. Low rates, top quality. Call or write for rate sheet. VISA, MC, and phone orders accepted. Mass. residents add 5% tax. Add \$1.75 shipping 1st dozen, \$.75 ea. additional. Free shipping on prepaid orders for 5 dozen or more. Write or call for rate sheet for large quantities. Dealer inquiries invited.



SOFTWARE
P.O. BOX 336
MAYNARD, MA 01754
(617) 568-8641

ACCEL 3/4

Compiler for TRS-80 Basic, Model I/III

\$99.95

+ \$2 Shipping CA add 6%

Extra-Compatible

ACCEL3/4 will handle the whole Basic language, and more.

Even non-standard Basic extensions don't bar compilation. E.g., the 20 new Basic keywords established by ENB (Southern Software's new relational dbms).

Includes ACCEL3 (5.5K, all DOS) AND ACCEL4 (TRS-DOS/LDOS overlay version).

FCCMD

Use FC instead of DIR for a full-screen display of drive-directories, ordered as you choose. Point the floating cursor and execute shorthand commands against any file on any drive.

- Shows up to eight drive-directories
- Many column orderings available.
- Easy-to-learn shorthand saves 90% of the typing.
- Many built-in DOS commands, supports user-added commands.
- Relocatable, works with DOSPLUS, LDOS, NEWDOS80, TRSDOS.

A must for multi-drive systems, gives far better visibility, saves time and typing, brings order to your files.

\$25 + \$1.50 Shipping

New

EDIT

Full-Screen Editor for TRS-80 Basic, Mod I/III

You need better-than-wordprocessor control when you write and edit BASIC programs. That's why EDIT has lots of better-than-wordprocessor features.

- Full-floating cursor with autorepeat (including function keys).
- Navigation by cursor-controlled scrolling, by line number or by program content.
- Overtype, Delete or Insert characters of text (including line numbers).
- Join or Split lines. Copy, Delete, Insert, Move, Position or Replicate lines.
- Copy, Delete, Move, Position or Replicate blocks of lines.
- Find and/or Replace occurrences of strings.
- Over 30 commands and functions, supports lower-case.
- 3.3K, relocatable (all OOS), also includes TRSDOS, LOOS overlay version.

\$40

You owe it to your programming.

DOSPLUS tm Micro Systems Software, LDOS tm Logical Systems,
NEWDOS80 tm Apparat, TRSDOS tm Tandy

Allen Gelder Software

Box 11721 San Francisco, CA 94141 (415) 561-3371

Listing continued

Listine continues

Enter Another Dimension

The world of 3D.

You'll find it in **80 MICRO**'s Anniversary Issue: true stereoscopic three-dimensional Color Computer* graphics, with your own complimentary pair of 3D glasses bound right into the magazine. This is the biggest **80 MICRO** we've ever published, 600 pages loaded with the kind of programs and information you need:

- stereoscopic 3D Color Computer graphics programs
- how to shop for a printer
- 3-year **80 MICRO** index, annotated and cross-referenced
- CoBOL tutorial for beginners
- a list of over 200 user's groups
- Model II utilities and applications programs
- Bill Barden's introduction to Assembly Language
- NODOS 80—disk utilities for cassette users

And it's yours for only \$5.95. Order your Anniversary Issue today. Use the attached order form, the coupon below, or call toll free

1-800-258-5473

and use your MasterCard, Visa or American Express.

Experience the 3rd Dimension.
Order your **80 MICRO** Anniversary Issue today.

*TRS-80 Color Computer & TRS-80 are trademarks of RadioShack, a division of Tandy Corp.

You can also get the Special Edition Load 80 Companion to the Anniversary Issue: dozens of programs on easy-to-load cassette or disk. Save hours of keyboarding. The Anniversary Issue Load 80 cassette is just \$9.95; the disk, \$19.95. Programs included run only on the TRS-80* Model I and Model III computers.

YES! I want to enter another dimension.

Send me _____ copies of **80 MICRO**'s Anniversary Issue
@ \$5.95 for a total of _____

Send me The Special Edition LOAD 80 Companion*
to **80 MICRO**'s Anniversary Issue
_____ cassettes @ \$ 9.95 _____
_____ diskettes @ \$19.95 _____
total _____

MC VISA AE CHECK/MO

CARD# _____ EXP. DATE _____

SIGNATURE _____

NAME _____ INTERBANK# _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

80 Micro • 80 Pine Street • Peterborough, NH 03458

Please allow 6 to 8 weeks for delivery.

9-83

*LOAD 80 programs are for TRS-80 Model I and Model III only.

Lisine continued

Listings continues

Listing continued

```

79C7 52    08520 RDIND  DEFB   'R'      ;R=READ DIR, N=NOREAD
79C8 3F    08530 KBIND  DEFB   '?'      ;KEYBOARD DIGIT
79C9 00    08540 SECNUUN DEFB   0       ;SECTOR TO BE READ
79CA 0000  08550 FRCTR  DEFW   0       ;# FREE GRANS
79CC 0000  08560 ALCTR  DEFW   0       ;# ALLOCATED GRANS
79CE 0000  08570 NACTR  DEFW   0       ;# NOT-AVAIL GRANS
79D0 00    08580 SCCTR  DEFB   0       ;SCAN COUNTER
79D1 00    08590 CODCTR DEFB   0       ;CODE CTR (FILE ID)
79D2 00    08600 WCTRI  DEFB   0       ;WORK COUNTER
79D3 00    08610 LINECT DEFB   0       ;LINE COUNTER
79D4 00    08620 ROWCTR DEFB   0       ;ROW COUNTER (DISPL ROW)
79D5 0000  08630 SECADR DEFW   0       ;WHERE SECT TO BE READ TO
79D7 0000  08640 GTADDR DEFW   0       ;GRAN TABLE ADDRESS
79D9 0000  08650 FSADDR DEFW   0       ;FILE SAVE AREA ADDRESS
79DB 0000  08660 DEADDR DEFW   0       ;DIRECTORY ENTRY ADDR
79DD 0000  08670 EXADDR DEFW   0       ;ADDR OF 2-BYTE EXTENT
79DF 0000  08680 MSADDR DEFW   0       ;MAP SAVE AREA ADDR
79E1 0000  08690 NSBASE DEFW   0       ;MAP SAVE BASE ADDR
0850          08700 GRTBL  DEFS   80      ;GRNRULE TABLE (40 TK)
7A33 30    08710 TRKTBL DEFM   '00-0304-0708-1112-1516-1920-2324-2728-3132-
3536-39'
 30 2D 30 33 30 34 2D 30
 37 30 38 2D 31 31 31 32
 2D 31 35 31 36 2D 31 39
 32 30 2D 32 33 32 34 2D
 32 37 32 38 2D 33 31 33
 32 2D 33 35 33 36 2D 33
 39
7A65 1027  08720 CONVTB DEFW   10000   ;TABLE USED TO
7A67 E803  08730 DEFW   1000    ;CONVERT BINARY IN HL
7A69 6400  08740 DEFW   100    ;TO DECIMAL
7A6B 0A00  08750 DEFW   10    ;VALUE
7A6D 0100  08760 DEFW   1    ;AND THE RESULT
7A6F 58    08770 ASCII  DEFM   "XXXXX" ;GOES HERE.
  58 58 58 58
 0100          08780 SEC0  DEFS   256    ;TRACK 17, SECTOR 0
 0000          08790 SECTS DEFS   2048   ;SECTS 2-9
 0400          08800 SCRPAT DEFS   1024   ;SCREEN DISPLAY PATTERN
 0400          08810 MSAREA DEFS   1024   ;MAP SAVE AREA
 0400          08820 PSAREA DEFS   1024   ;FILENAME SAVE AREA
 8F74 20    08830 BLANKS DEFM   '        ;JUST BLANKS.
  20 20 20 20 20 20 20 20
  20 20 20
BF80 00    08835 ZEND   DEFB   0       ;END OF PROGRAM
 08840 ; * * * * * *
 7000          08850 END     START
 00000 TOTAL ERRORS

```

FREE EPSON MX-80 PRINTER

With the
purchase of a
TRS-80, Model IV

For a limited time, Data Services, Inc., will give you a **FREE** Epson MX-80 Printer (\$645 value), when you buy a TRS-80 Model IV, 48K, with two 40 track drives. Call for our newest low prices.

(Includes RS-232, Printer Cable, TRSDOS)

The perfect system, the perfect price!
TRS 80 Model III, 48k - two PERCOM 40
track drives - EPSON MX-80 Printer.

Data Services offers more — APPARAT'S NEWDOS 80, version VER 2.0, regularly \$149.95 — now only **\$119.95** (Model III units only.)

Up to 20% savings on TRS computers — accessories — programs. Plus: EPSON / PERCOM / APPARAT / HAYES SMARTMODEM / VERBATIM DISKETTES / MEMOREX DISKS.

*TRS-80 is a trademark of Tandy Corporation.



- **FREE SHIPPING** in 48 contiguous states.
- **No Sales Tax** on out-of-state orders.
- **Visa/Master Card** welcome.
- Personal checks, allow 3 weeks to clear.
- (International orders, freight F.O.B. Wichita, Kansas)

CALL TOLL FREE: 1-800-835-1129

or order by mail from:

✓118

DATA SERVICES, INC.
COMPUTER SERVICES SINCE 1970

P.O. Box 1157 Wichita, Kansas 67201-1157
(In Kansas, call 1-316-838-9021)

TRS-80[®] **WOBOS[™]** I

WEATHER ORGANIZER

Basic Operating System

WOBOS I is a menu driven, prestructured program in BASIC that provides access to over 30 utility functions during development or actual use of a program. Its unique layout allows you to develop your programs within a well organized environment that provides a very strong foundation to build upon. You always had to start from scratch before out how, when, looking WOBOS I, you'll start with over 11K of structured and system utilities. Imagine what we can do for your productivity! WOBOS I is not an accessory to your program. It actually becomes its foundation!

WOBOS I for Model III BASIC	DSK 01-05 2194 16
PROGRAMS MENU	UTILITIES
1 The Project A	11 Auto List
2	12 Exit
3	13 Resources
4	14 Assembler
5	15 Memory Dump
6	16 Mail
7	17 Device Selection
8	18 New Date Entry
9	19 Device I-O

Illustrated above is the Primary Menu of WOBOS I for Model III. In addition to the features shown, the DEVICE I-O option is a separate 9-choice menu that will allow you to compile, update, load and output programs. It also includes a utility that will save both the DATA and WOBOS I on tape and/or DSK.

With controllable SOUND!

"Once you've used it, you'll never write another program without it!"

Model	III	I	COLOR
BASIC MODEL III	DSK	LEVEL 8	DSK
P/N CC1021	CD1031	CC1022	CD1032

Shipped First Class Airmail at no extra charge
if you mention this ad.

ON QUALITY CASSETTE & MANUAL

ORDER PHONE	VISA	ONLY
(503) 288-1133	MasterCard	\$35

SEND CHECK, MONEY ORDER OR NUMBER AND
EXPIRATION DATE OF YOUR CREDIT CARD TO:

W T F O D I C 42 179
395 N Hayden Bay Drive, Portland, Oregon 97217

Dedicated to Excellence since 1976

- 183-80 Is a TM of TRS-80 Corp.

✓119

DISPLAYED VIDEO IS DRIVING DOWN PRICES ON DISKS!



FREE SHIPPING!



TEC'S NEW HALF-HIGH 40 TRACK DISK DRIVE W/CASE & POWER SUPPLY AT AN INCREDIBLE LOW PRICE!

\$195.00!!!!

NEW!

TRUE HALF HEIGHT DRIVES!

1 5/8 INCH NOT 2 INCH OR 2 7/16 INCH! DIRECT DRIVE!
NO DRIVE BELT! 3MS TRACK TO TRACK!

"YOU CAN BUY THE REST BUT WHY NOT BUY ONE OF THE BEST!"

TEAC'S NEW SLIMLINE 40 TRACK W/CASE & POWER SUPPLY.....	\$240.00
TANDON 40 TRACK TM-100-1 W/CASE & POWER SUPPLY.....	\$225.00
(DOUBLE SIDED 40 TRACK DRIVES ADD \$75.00)	
SHUGART NEW SLIMLINE DOUBLE SIDED 40 TRACK W/CASE & POWER SUPPLY.....	\$299.00
SHUGART NEW SLIMLINE DOUBLE SIDED 80 TRACK W/CASE & POWER SUPPLY	\$379.00
TANDON SINGLE SIDED SLIMLINE 8" DISK DRIVE W/DUAL CASE & POWER SUPPLY	\$545.00
TANDON DOUBLE SIDED SLIMLINE 8" DISK DRIVE W/DUAL CASE & POWER SUPPLY	\$625.00

TWO DRIVE CASES AVAILABLE AT VARIED PRICES

TWO DRIVE 5 1/4" CABLE (FOR MOST COMPUTERS)....\$23.99 WITH GOLD PLATED CONNECTORS

DV'S COLOR COMPUTER 1st DRIVE ONLY.....\$389.00

**ONE YEAR WARRANTY ON TEAC & SHUGART DRIVES/180 DAYS ON TEAC & TANDON
HAYES SMART MODEM 300 BAUD.....\$225.00 1200 BAUD.....\$525.00**

TWO DRIVE 5 1/4" CABLE (FOR MOST COMPUTERS)....\$23.99 WITH GOLD PLATED CONNECTORS

PRINTER PRICES

WE'RE NOT GOING TO MAKE YOU CALL FOR PRICES — HERE THEY ARE IN BLACK AND WHITE!!!

EPSON

MX80 W/GRAFTRAX PLUS.....	\$379.00
MX80 FT W/GRAFTRAX PLUS.....	\$495.00
MX100 W/GRAFTRAX PLUS.....	\$659.00
RX80 W/GRAFTRAX PLUS.....	\$409.00
FX80 W/GRAFTRAX PLUS.....	\$569.00
FX100 W/GRAFTRAX PLUS.....	\$805.00

**PRINTER CABLE 10' LONG W/GOLD PLATED CONNECTORS STARTING AT.....\$25.99
DAISY WHEEL PRINTERS AVAILABLE AT VARIED PRICES**

Visit our two
retail locations at:

**886 Ecorse Road
Ypsilanti, MI 48197
(313) 426-5086/(313) 482-4424**

**111 Marshall Street
Litchfield, MI 49252
(517) 542-3280
(517) 542-3939
(517) 542-3947**

WE CARRY TRS80, LNW, EPSON & FRANKLIN COMPUTERS

IMMEDIATE DELIVERY

**180 Days Parts and Labor Warranty
DEALER INQUIRIES INVITED**

Free Shipping in the U.S.
48 Contiguous States



SHIPPING!

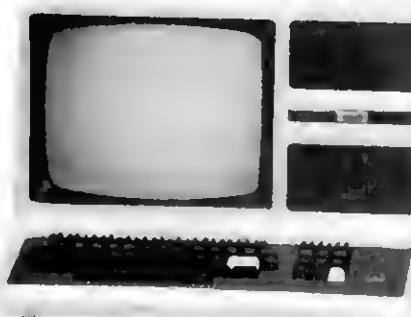
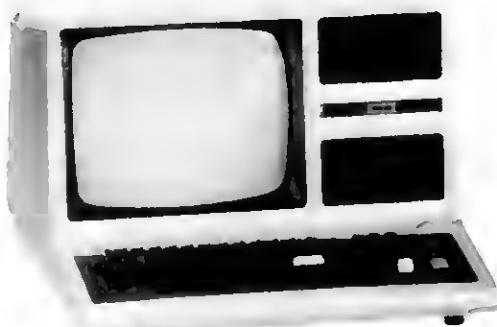
TO ORDER: Call (313) 426-5086 or (313) 482-4424 or (517) 542-3280

(517) 542-3939 (517) 542-3947

OR WRITE: DISPLAYED VIDEO 111 MARSHALL ST., LITCHFIELD, MI 49252

*TRS-80 is a trademark of the Tandy Corporation

DV'S EXCLUSIVE "YOU CAN'T LOSE" SIX MONTH WARRANTY!



"NO YOU'RE NOT SEEING THINGS, THAT'S FOUR INTERNAL DRIVES IN A MODEL 4, WITH UP TO 4 MEG. DISK STORAGE AVAILABLE NOW, ONLY FROM DISPLAYED VIDEO!!"

DISPLAYED VIDEO IS DRIVING DOWN PRICES ON DISK!

DISPLAYED VIDEO is now offering TRS-80[®] MODEL 4 with TANDON/TEC/TEAC disk drives, one of the most reliable disk drive systems on the market, for **INCREIBLY** low prices.

MODEL 4 with 64K dual 40 track double density disk drives, complete systems with TRSDOS 6.0 and one BOX OF DISKETTES

PLUG IT IN AND GO..... \$1599.00/128K.....\$1679.00

MODEL 4 with 64K dual 40/40 track double density disk drives, complete systems with TRSDOS 6.0 and one BOX OF DISKETTES

PLUG IT IN AND GO..... \$1899.00/128K\$1979.00

MODEL 4 with 64K dual 80 track double density disk drives, complete systems with TRSDOS 6.0 and one BOX OF DISKETTES

PLUG IT IN AND GO..... \$1899.00/128K 1979.00

MODEL 4 with 64K dual 80/80 track double density disk drives, complete systems with TRSDOS 6.0 and one BOX OF DISKETTES

PLUG IT IN AND GO..... \$2199.00/128K 2279.00

MODEL 4 with 64K four 40 track double density internal disk drives, complete systems with TRSDOS 6.0 and one BOX OF DISKETTES

PLUG IT IN AND GO..... \$2299.00/128K\$2379.00

MODEL 4 with 64K four internal drives of any configuration available to achieve up to 4 meg of disk storage..... **CALL**

MODEL III/4 Internal Two Drive Kit: Includes controller board, dual drive mounting bracket, dual power supply, all hardware cable; and connectors (gold plated) & TEC Drive..... **\$399.00**

4 DRIVE KIT MINUS DRIVE \$349.00

MODEL 100 8K.....\$679.00 24K.....\$839.00

DVS MODEL I DOUBLE DENSITY BOARDS....\$89.00

WE CARRY TRS-80, IBM, LNW, EPSON & FRANKLIN COMPUTERS

Visit our retail location at:

**111 Marshall Street
Litchfield, MI 49252**

(313) 426-5086

(313) 482-4424

(517) 542-3280

(517) 542-3939

(517) 542-3947



**IMMEDIATE DELIVERY
DV'S SIX MONTH
PARTS AND LABOR WARRANTY**

Authorized Dealerships
111 Marshall Street, Litchfield, Michigan 49252
To Order Call (313) 426-5086, (313) 482-4424, (517) 542-3280
(517) 542-3939, (517) 542-3947
OR WRITE:

Displayed Video, 111 Marshall St., Litchfield, MI 49252

*TRS-80 is a trademark of the Tandy Corporation

Prices subject to change without notice

The LDOS Toolbox

by Jim Heid

The utilities to perfect LDOS are available in Powersoft's Toolbox. You'll also get patches and filters to make your system manageable.

★★★★

The Toolbox for LDOS
Powersoft
11500 Stemmons Fwy.
Suite 125
Dallas, TX 75229
Models I and III
One disk drive, LDOS
\$69.95

Finally, a set of tools I can use without busting my knuckles! The Toolbox for LDOS is a set of utility programs, patches, and filters that makes the best TRS-80 disk operating system even better.

What's a Utility?

A utility is a program that makes using the computer easier. Some utilities add features your computer lacks, such as a different keyboard arrangement. Some work with your word processing program to improve your text.

Others make life easier for disk drive owners by simplifying certain disk operating system (DOS) commands and functions. And some come to the rescue to repair a disk when that vital file won't load.

The Toolbox does all the above and more (see Table 1). Kim Watt, the author of Super Utility Plus, wrote it. The programs in The Toolbox do many things that Super Utility Plus (SU+) does, but they work with LDOS-for-

matted disks only.

They also work with double-sided disk drives and with hard disks, something even SU+ can't do. In fact, this package lets you work with all LDOS-supported disk drives, including single- or double-density, single- or double-sided, 5½- or 8-inch floppy disk drives, and fixed or removable hard disk drives.

The Package

The Toolbox package contains 19 machine-language programs, two LDOS filter programs, one LDOS patch, and two sample files, all stored on two 5½-inch disks and accompanied by a 6- by 9-inch, 51-page manual.

You cannot duplicate the disks, but they contain an easy-to-use copy program that transfers The Toolbox programs onto your own single-density disks. Once you transfer them, you can copy them as often as you want.

The Toolbox utilities are written for use with LDOS 5.1.3. Model I users can use them without modification on any LDOS 5.1.x release. Model III users must patch 15 of the programs; the patches are easy to apply and are listed in the front of the manual. You cannot use the programs with the LDOS 5.0.x series.

The Programs

PMOD lets you examine and modify the contents of memory or of a disk. You can browse through the contents of

a disk using the arrow keys, or supply a file name to modify or examine the contents of a particular file without searching the entire disk.

You can type your modifications in hexadecimal (hex), ASCII, decimal, binary, or octal. A sample PMOD screen appears in Fig. 1.

PCHECK is a directory-checking utility. The directory is a disk's table of contents. It contains the information that tells LDOS where your files are located on the disk, how much free space is available, when you last updated a file, and so on.

PCHECK reads a disk's directory and performs a complex, three-stage test to ensure that the directory's information is accurate. It's capable of finding 16 possible error conditions (see Fig. 2).

The error messages are definitely not phrased for the novice, but this makes sense, since the directory is a complex place that novices don't usually access anyway. How could you phrase "Directory links to record not linking back to it" for the novice?

PFIX is the companion program to PCHECK. It fixes most directory errors that PCHECK finds, and also repairs a disk that no longer boots.

The instructions for PFIX state, "In conjunction with PCHECK, most directory problems can be easily located and corrected without extensive knowledge of how directories are formatted."

To test this claim, I set up a test disk and, using PMOD, introduced five errors in the disk's directory. I then checked the disk using PCHECK. It found all the errors, and reported them as shown in Fig. 3.

Next, I ran PFIX to repair the GAT table. (You don't need to know what these letters stand for to use the pro-

Give us a call and it's on its way.

Our inventory is so huge, we've probably got just what you want in stock. We'll ship it out right now. At the right price.

PRINTERS

	SCALL
STAR MICRONICS GEMINI 10.....	739.00
8MC PB101.....	769.00
COMREX CR-1 PARALLEL.....	1250.00
C-ITOH F-10 40 CPS P/S.....	1250.00
C-ITOH 8510 PROWRITER PARALLEL.....	410.00
C-ITOH 1550 PARALLEL.....	699.00
EPSON FX-80 W/GRAFTRAX +.....	SCALL
EPSON MX-100 III W/GRAFTRAX +.....	SCALL
EPSON RX-80.....	SCALL
EPSON RX-80 W/GRAFTRAX.....	SCALL
IOS 480 MICROPRISM.....	498.00
NEC 8023A.....	425.00

EPSON ACCESSORIES

MICROBUFFER‡ MB8-8K.....	159.00
MICROBUFFER‡ MBP-15K.....	159.00
MICROBUFFER‡ MBP-32K.....	SCALL
MICROBUFFER‡ MBP-64K.....	SCALL
MICROBUFFER IN-LINE 32K.....	299.00
MICROBUFFER IN-LINE 64K.....	349.00
GRAFTRAX PLUS.....	60.00
MX-80 RIBBONS.....	8.95
MX-100 RIBBONS.....	19.95

DISKETTES

SCOTCH 3M	
5.5D.DEN 40 TRK 10, 16 sectors.....	23.50
0.5D.DEN 40 TRK 10, 16 sectors.....	36.50

VERBATIM

MD 525-01, 10, 16.....	26.50
3M DISK CLEANING KIT.....	19.95
BIB DISK CLEANER only.....	9.80

DISKETTES STORAGE

5 1/4" PLASTIC LIBRARY CASE.....	2.50
FLIP & FILE 5 1/4".....	19.95

TRS-80 HARDWARE

TANDON 40 TRK DISK DRIVE W/P.S.....	289.00
PERCOM DATA SEPARATOR.....	27.00
PERCOM DOUBLER II W/ DOS 3.4.....	159.00
WICO TRACKBALL 16 COLOR COMPUTER.....	62.00

MICRO-LABS

GRAFYX SOLUTION MOD III.....	249.00
------------------------------	--------

MICRO MAINFRAMES

FD 3C 4 DRIVE CONTROLLER.....	259.00
-------------------------------	--------

LNW RESEARCH TRS MOD I COMPATIBLE

AMOE RGB.....	669.00
BMC.....	89.00
LNW MOD II COMPUTER w/CP/M 2.2.....	SCALL
LNW EXPANSION INTERFACE.....	345.00
LNW DOUBLER w/DOS+3.3.....	138.00
LNW 5/8 DOUBLER w/DOS 3.4.....	181.00
NEC GREEN.....	159.00
USI AMBER.....	160.00

ISOLATORS

ISO-1 3-SOCKET.....	49.95
ISO-2 6-SOCKET.....	49.95
DG 115-S 6-SOCKET SWITCHED.....	34.50
OATAGUARD DG 115-P.....	25.58
UL8TME-6 8-SOCKET SWITCHED.....	20.80

MODEMS

NOVATION J-CAT.....	125.00
NOVATION SMART-CAT (300 Baud).....	209.00
NOVATION SMART-CAT (1200 Baud).....	455.00
NOVATION D-CAT (1200 Baud).....	619.00
HAYES SMART MODEM (300 Baud).....	227.00
HAYES 1200 SMART MODEM.....	540.00
SIGNALMAN (300 Baud).....	85.00
LYNX.....	265.00
SPECIAL: Buy any Modem & purchase (at the same time) OMNITERM for only.....	75.00
SERIAL CABLE.....	30.00

SUPPLIES

AVERY TABULABELS	
1,000 3 1/2 x 15 1/8.....	8.49
3,000 3 1/2 x 15 1/8.....	14.95
5,000 3 1/2 x 15 1/8.....	17.80

FAN FOLD PAPER

(Prices F.O.B. S.P.)	
9 1/2 x 11 18lb WHITE 3,000 ct.....	29.00
14 7/8 x 11 18lb WHITE 3,000 ct.....	39.00
REDIFORM LAZER CUT REDIEGEE.....	15.50

MODEL I, III SOFTWARE

ALCOR PASCAL.....	249.00
DOS PLUS 3.5 MOD I or III.....	99.00
ELECTRIC WEBSTER.....	118.50
FLOPPY DOCTOR, MOD III.....	24.50
LAZYWRITER.....	135.00
L, L DOS Ver 5.1 MOD I or III.....	109.00
MAXI MANAGER Ver 8.0, w/UTILITY.....	118.00
MAXI MANAGER UTILITIES ONLY.....	44.95
MICROCOM MOD I.....	24.50
MICROSOFT FORTRAN MOD I only.....	79.00
OMNITERM, SMARTERM Pkg/MOD I / III.....	79.95
NEW DOS 80 Ver 2.2.....	122.50
PROFSOFT NEWSCRIPT w/Mail Labels MOD I & III.....	105.00
THE HOME ACCOUNTANT.....	59.50
ZORLOFF II.....	63.50

BOOKS

BASIC-ENGLISH DICTIONARY.....	16.50
CUSTOM I/O MACHINE LANGUAGE.....	24.85
HOW TO DO IT ON THE TRS-80.....	28.95
MICROSOFT BASIC DECODED.....	24.85
MICROSOFT BASIC FASTER & BETTER.....	24.85
THE CUSTOM TRS-80.....	24.85
THE BASIC COOKBOOK.....	5.85
TRS-DOS 2.3 DECODED.....	24.85
TRS-80 DISK & MYSTERIES.....	16.85
WRITING BASIC ADVNTRS FOR TRS-80.....	8.95
30 COMPUTER PROGRAMS FOR THE HOMEOWNER IN BASIC.....	8.95
80 PROGRAMS FOR TRS-80.....	9.90
101 PROJECTS FOR THE Z80.....	15.50

TRS HARDWARE

MODEL III DISK DRIVE KITS Contain: Tandon Disk Drives and Micro Mainframes 4 Drive Controller with Power Supply.	
KIT 1: 2 TANDON™100-1 & FD3C.....	638.00
KIT 2: 2 TANDON™100-2 & FD3C.....	773.00
KIT 3: 2 TANDON™100-3 & FD3C.....	748.00
KIT 4: 2 TANDON™100-4 & FD3C.....	956.00
CASE & POWER SUPPLY 1 Drive.....	78.00
CASE & POWER SUPPLY 2 Drives.....	99.00

TANDON 5 1/4 INCH

100-1 SINGLE HEAD 40 TRK.....	195.00
100-2 DUAL HEAD 40 TRK.....	262.50
100-3 SINGLE HEAD 80 TRK.....	250.00
100-4 DUAL HEAD 80 TRK.....	369.00

TRS CP/M FROM PICKLES & TROUT

MOD II, 16, 12 COMPATIBLE.....	185.00
--------------------------------	--------

PRINTER STANDS

FMJ STEEL STAND 80cm.....	21.95
FMJ STEEL STAND 100cm.....	29.95
LUCITE STAND 80cm.....	32.50

COVERS

TRS MOD I KEYBOARD.....	7.50
TRS MOD II VIDEO DISPLAY.....	9.50
TRS MOD II.....	14.50
TRS MOD II KEYBOARD.....	7.50
TRS MOD II ENTIRE UNIT.....	21.50
VIDEO & EXPANSION INTERFACE.....	12.50
PRINTER COVERS AVAILABLE.....	SCALL

TRS-80 GAMES

Mod I & III: All games are disk. Cassette versions may not be available.	
APPLE PANIC.....	22.50
ARMORED PATROL.....	23.50
ASYLUM II or I.....	19.50
ALIEN DEFENSE.....	16.50
BLACKHOLE.....	23.50
CATERPILLAR.....	16.50
CRUSH, CRUMBLE AND CHOMP.....	23.36
DEADLINE MOD I or III.....	38.96
FLITE SIMULATOR.....	28.50
FROGGER.....	18.50
HELLFIRE WARRIOR.....	31.35
LUNAR LANDER.....	23.36
MEAN CHECKER MACHINE.....	17.50
MORTON'S FORK.....	19.00
OLYMPIC DECATATHLON.....	23.36
PENETRATOR.....	21.50
PINBALL.....	16.50
REAR GUARD.....	19.90
REGILIAN WORM.....	16.50
RESCUE AT RIGEL.....	23.36
ROBOT ATTACK.....	15.95
SEADRAGON.....	19.90
STARCROSS MOD I or III.....	37.16
STARFIGHTER.....	23.50
STARFLEET ORION.....	21.95
STAR WARRIOR.....	31.35

To order or for information call

From Chicago:
(312) 454-1236

From New York:
(212) 509-1923

In Los Angeles:
(213) 706-0333

From Dallas:
(214) 744-4251

By Modem:
(213) 991-1604

CALL OUR MODEM LINE
FOR WEEKLY SPECIALS.

Alpha Byte
COMPUTER PRODUCTS

31304 VIA COLINAS
WESTLAKE VILLAGE, CA 91362
*For all your computer product needs, come visit us at our new California store. -473

Satisfaction Assurance — Your satisfaction is assured by our 30 day moneyback guarantee on all hardware products we sell. No refunds after 30 days. All manufacturers' warranties are honored by manufacturers. Defective software will be replaced free during the first 30 days, however, no refunds or exchanges on software. Proof of purchase required. All returns must be authorized in advance. How To Order — All orders must be paid prior to shipment. Order by phone or by mail. Use Visa, M/C, check or COD. COD limit \$300. Shipping charges: Visa, M/C orders = actual shipping costs. Prepaid orders and \$3 (under 25lbs.) or \$6 (over 25lbs.) COD's use prepaid rates and add \$4 surcharge. Foreign, FPO and APO orders add 15% of order total. Calif. orders add 6 1/2% sales tax. L.A. County add 6 1/2% sales tax. Prices quoted are subject to product availability and may change without notice. Satisfaction Assurance — Your satisfaction is assured by our 30 day moneyback guarantee on all hardware products we sell. No refunds after 30 days. All manufacturers' warranties are honored by manufacturers. Defective software will be replaced free during the first 30 days, however, no refunds or exchanges on software. Proof of purchase required. All returns must be authorized in advance. How To Order — All orders must be paid prior to shipment. Order by phone or by mail. Use Visa, M/C, check or COD. COD limit \$300. Shipping charges: Visa, M/C orders = actual shipping costs. Prepaid orders and \$3 (under 25lbs.) or \$6 (over 25lbs.) COD's use prepaid rates and add \$4 surcharge. Foreign, FPO and APO orders add 15% of order total. Calif. orders add 6 1/2% sales tax. L.A. County add 6 1/2% sales tax. Prices quoted are subject to product availability and may change without notice.

CPI is a reg. trademark of Digital Research.

*Requires Z-80 Softcard

†Reg. trademark of Micro Pro International Corp.

‡Trademark of Practical Peripherals, Inc.

**Trademark of Software Dimensions, Inc.

grams; you simply tell PFIX what PCHECK told you when it tested the disk, and it does the rest.) The disk drive came on for a few seconds, and a message told me that the fix was completed. I ran PCHECK to make sure. PFIX had located and repaired all the errors.

If you have a disk formatted a few years ago that is victim to frequent "SECTOR NOT FOUND" or CRC errors, the magnetic charges in the disk's surface might be weakened. PREFORM, a utility that formats a disk without erasing the data on it, can help.

PREFORM reads a track, reformats the track, then rewrites the data that it read. I used it to refresh several older disks, and it works well. PREFORM does not work with hard disk drives.

PVU is a disk-verification utility. It reads a disk and informs you of any faulty sectors. You can specify the drive to be tested, the track number to start testing, and a pause at each bad sector.

PCLEAR erases all unassigned granules, any part of the disk that a file isn't using. It also erases the contents of a particular file and cleans up a disk's directory by clearing unused directory records.

Using PCLEAR, you can wipe out every trace of that confidential memo. Better yet, you can replace the confidential data with the string of your choice.

Assume you have a file called Secret/SCR. At the LDOS READY prompt, type PCLEAR, SECRET/SCR, "HA! FOOLLED YOU!". The phrase HA! FOOLLED YOU!, repeating over and over again, replaces the data in the file. It's a fine way to foil file foes.

PSS is a sector status utility. It lets you identify which file is assigned to any sector on a disk. You simply supply PSS with the drive, track, and sector numbers, and it determines whether that sector is assigned to any file. If the sector is in use, PSS tells you the file name that it is assigned to, and the relative sector number within that file.

PMAP lets you locate the sectors that make up a particular file and determine the status of all granules on a disk. You can print the report that the program displays.

The PASSGO utility is handy when you forget a password. It lets you remove a password from a single file or an entire disk. You can also specify that passwords be removed on invisible and system files.

PUN is a disk un-repair program. It reverses the effect of the LDOS Repair

Type of System—utility package for LDOS users
Machine-language command files, one LDOS patch
Utility programs are parameter driven
Help screens provide on-line description of parameters
Package supplied on two single-density disks,
each containing a copy program for transferring the files

Summary of Programs

PMOD—disk editing utility that allows examination and modification of disks.
PCHECK—directory check utility that reads directory and reports any errors.
PFIX—directory repair utility that repairs errors found by PCHECK.
PREFORM—disk reformat utility that formats a disk without erasing its data.
PVU—disk verification utility that finds and reports faulty disk sectors.
PCLEAR—disk clean-up utility that clears directory entries for killed files and clears unassigned granules.
PSS—sector status utility that identifies which file is assigned to any sector.
PMAP—disk/file mapping utility that locates sectors comprising a file and determines the status of all granules on a disk.
PASSGO—password removal utility that removes passwords from a single file or all files on a disk.
PUN—disk unrepair program that reverses effect of LDOS repair (alien) command.
PKILL—file killing utility that permits killing of multiple files with a minimum of typing.
PCOMPARE—disk/file comparison utility that compares two disks or files and identifies differences between them.
PFIND—search and replace utility that finds a given string or byte value and optionally replaces it.
PMOVE—file copying utility that transfers multiple files.
PERASE—disk bulk-erase utility that removes all traces of data from a disk.
PDIRT—directory read utility that permits reading of a Model III TRSDOS disk directory without leaving LDOS.
PEX—disk drive exercising utility that steps head in and out.
PHELP—LDOS help utility that contains descriptions for all LDOS library commands and some utilities.
PMX/FLT—filter for printing TRS-80 graphics on Epson MX-80 printer.
DVORAK/FLT—filter that converts the keyboard layout to Dvorak arrangement.
PFILT/FLT—user definable filter that filters input or output devices.
PBOOT/FLT—patch for customizing LDOS boot display.

Table 1. The Toolbox at a glance.

```
. T00.2C20 6279 2073 7570 706C 7969 6E67 2061., by supplying a
HEX 010.2066 696C 6520 6E61 6D65 2C20 796F 7520. file name, you
DRV 020.6361 6E20 6D6F 6469 6679 206F 7220 6570.can modify or ex
1 L30.616D 696E 6520 7468 6520 636F 6E74 656E.amine the conten
B40.7473 206F 6620 6120 7061 7274 6963 756C.ts of a particul
050.6172 2066 696C 6520 7769 7468 6F75 7420.ar file without
X68.6061 7669 6E67 2074 6F20 7365 6172 6368.having to search
70.2074 6865 2065 6E74 6972 6520 6469 736B. the entire disk
S80.2E20 596F 7572 206D 6F64 6966 6963 6174.. Your modificat
C90.696F 6E73 2063 616E 2062 6520 7479 7065.ions can be type
RA0.6420 696E 2068 6578 2C20 4153 4349 492C.d in hex, ASCII,
B0.2064 6563 696D 616C 2C20 6269 6E61 7279. decimal, binary
RSEC C0.2C20 6F72 206F 6374 616C 2E20 4120 7361., or octal. A sa
0011 D0.6D70 6C65 2050 4D4F 4420 7363 7265 656E.mple PMOD screen
EOFS E0.2069 7320 7368 6F77 6E20 696E 2046 6967. is shown in Fig
0075 F0.2E20 312E 8E20 2020 5043 4845 434B.. 1.. PCHECK
```

Figure 1. Sample PMOD display.

(alien) command, which makes Model I TRSDOS disks readable by Model III LDOS.

PUN changes the data address marks on a repaired disk, so Model I TRSDOS can read the repaired disk. One trip through Punland, and LDOS and TRSDOS can read your disk. PUN works on the Model I only.

PKILL is a utility that lets you kill a number of files quickly with a minimum of typing. PKILL lets you classify the files to be killed according to various categories. For example, the command PKILL :1,/CMD kills all files on the disk in drive I with the /CMD extension. The command PKILL :1,A kills all files on the drive I disk.

Put 64K CP/M® 2.2 in your TRS-80 Model III and tap into 2,000 business programs.

Now you can run programs such as WordStar, dBASE II, SuperCalc, MailMerge and virtually thousands of other CP/M-based programs on your TRS-80 Model III.

CP/M 2.2 is the industry standard operating system that gives you access right now to over 2,000 off-the-shelf business programs.

Our plug-in Shuffleboard III comes with 16K of RAM, giving your Model III the power of full 64K CP/M 2.2 without interference of the ROM or video memory. In fact, the Shuffleboard will appear transparent in the TRS-80 mode and will not interfere with any DOS operation.

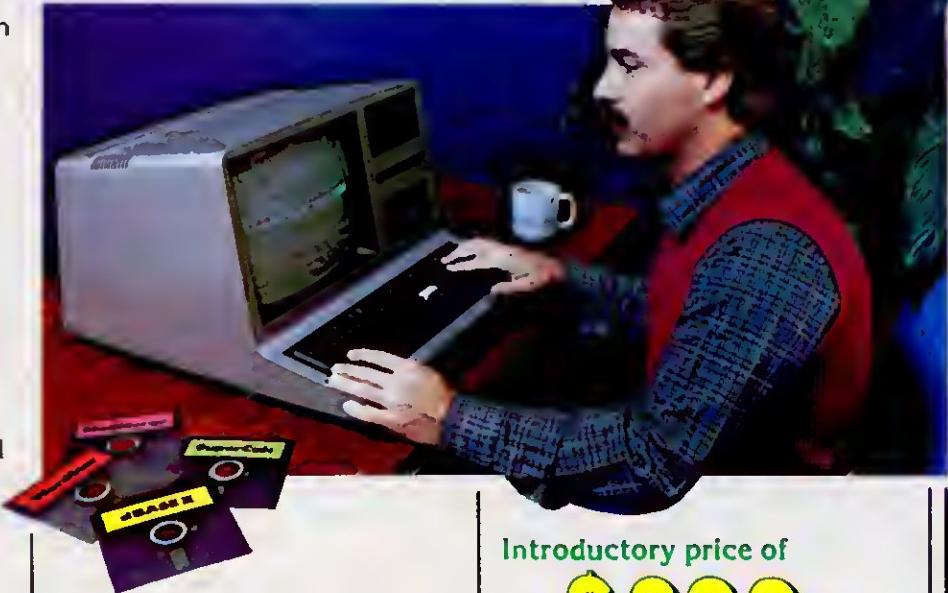
READ and WRITE Osborne, Xerox and IBM personal computer software plus many more popular formats.

Unfortunately, there is no standardized CP/M format for 5½" diskettes. But we have developed a way to READ/WRITE and RUN standard programs under the following single-sided formats: Osborne 1 S/D, Xerox 820 S/D, IBM PC* D/D for CP/M 86 only, Superbrain D/D, Kapro II D/D, HP 125 D/D and TeleVideo D/D.

*Will Read and Write Only.

Easy plug-in installation.

It's so simple. The Shuffleboard III plugs into two existing sockets inside your Model III. There are no permanent modifications, no cut traces and no soldering. You'll be up and running in minutes.



New Products.

80 x 24 VIDEO BOARD: Features dual intensity screen, programmable cursor control for block, underline & blink rate, on-board bell with audible keyclick, battery-operated real time calendar/clock, full ASCII character set plus 256 special character graphics, dual RS-232 outputs and composite video output.

FLOPPY DISK CONTROLLER: Now you can access 5½" and 8" floppy disk drives in any combination up to 4 drives of S/D density, S/D sided. Tap into a wealth of CP/M software which comes on 8" IBM 3740 format or Pickles & Trout CP/M for the Model II.

SOFTWARE: Additional CP/M software programs are available. Call or write for details.

Introductory price of

\$299.

The Shuffleboard III comes fully burned-in and tested complete with 64K CP/M 2.2 and MBASIC 80 interpreter, plus software manuals and a first class user's manual — with a 1-year limited warranty and 15-day no-risk free trial — for only \$299.

See the Shuffleboard III at your dealer's now.

Once you see what the Shuffleboard can do for your Model III you'll want one at once. If your dealer does not yet stock the Shuffleboard have him give us a call. Or send check, money order, VISA or MASTERCARD number (sorry, no COD's) plus \$5 shipping per board (\$17 outside the USA & Canada)* directly to the address below. Cal. residents please add sales tax. Credit card purchases can be phoned in directly and we'll ship from stock.

(415) 483-1008

*Air mail shipments to Canada & all other countries.

Memory Merchant™

14666 Doolittle Drive San Leandro, CA 94577
(415) 483-1008

v 461

SERIAL PORT EXPANDER AND MORE



BTA'S MODEL 524 MULTIPORT CONTROLLER is a card activated one-to-four serial port expander — but that's not all since it has separate and independent UARTS, buffers and handshaking; each port can operate with a different configuration, i.e., different baud rates, stop bits, etc. These features also permit two or more devices to communicate with the 524 simultaneously.



Full duplex with EIA RS-232 protocol
Baud rates up to 19,200

Expansion to 16 ports by cascading
Peripheral ports may be configured by user software

One year warranty



***MODEL 524** \$249.00

***MODEL 524A** \$279.00

same as model 524 except has 256 byte extra buffers per port

***MODEL 524D** \$269.00

same as model 524, plus continuous polling of each peripheral device for data transfer requests. The device is automatically connected when its 'turn comes up'. ON, BUSY and OFF messages are sent to the peripheral devices.

*Other models available — Contact us or your dealer for additional information.



✓240

PROFESSIONAL SOFTWARE TRS-80® MODEL 11 & 16

NOW AVAILABLE!

DISK SORT 2.0 FOR HARD DISK OR FLOPPIES NEW! UP TO 15+ % FASTER \$119.95*

TRS-DOS® 2.0a & 4.1 COMPATIBLE. FILL IN THE BLANKS & GO TO IT!
WILL SORT ANY RANDOM FILE OUTPUT OPTIONS TAGS, TAGS & KEYS, OR COMPLETE FILE
1,000 REC's SORTING 15 BYTES, INCLUDING ALL DISK I/O = 2 MIN 33 SEC's (FLOPPY)
HARD DISK IS MUCH FASTER! NON-STOP JOB STREAM EXECUTION

BASIC CROSS REFERENCE • SAVE HOURS! \$59.99*

• SEE USED LINE #s/NAMES AT A GLANCE • PRODUCES NICE PROGRAM LISTING
• OTHER OPTIONS INCLUDE MAKING NEW PROGRAMS, DROPPING REMARKS

CUSTOM PROGRAMMING/SYSTEMS DESIGN

*PLUS POSTAGE AND HANDLING PRICES SUBJECT TO CHANGE WITHOUT NOTICE

TRS-80 & TRSDOS
ARE REGISTERED
TRADEMARKS OF
TANDY CORP

DOC ONLY \$10.00
DEDUCTIBLE ON
PURCHASE

GOOD-LYDDON DATA SYSTEMS ✓186
5486 RIVERSIDE DR. • CHINO, CA 91710 • (714) 980-4563

M/C VISA
ACCEPTED

Complete Business Software Package

TRS-80 MOD. II/12/16
FLOPPY OR HARD DISK

ISSI

INTERNATIONAL SOFTWARE SALES INC.

- o General Ledger
- o Payroll w/Job Costing
- o Accounts Payable
- o Practice Management
- o Accounts Receivable
- o Structural Engineering
- o Inventory
- o Reviewed In April 80 MICRO

Software Modules All Interactive

P.O. BOX 223 - DEPT. A
NEWTONVILLE, N.Y. 12126

✓470

(518) 271-6825

EXPANDED

DATAMAN

to Data Manager

NEW FEATURES

- sss Field Manager - Change, Delete, Add, or Modify Fields ANY time.
- sss DATAMAN Text Writer - Merge Data Files with Form Letters, etc.
- sss Label Maker - Any Size. Merge from Data base or stand alone.
- sss Supports LEGAL Size Documents - Any Paper Width to 15 Inches.

OTHER FEATURES

- | | |
|--------------------------------------|-------------------------------|
| • Auto Report Generator | • Auto Screen Format |
| • Auto Totals & Subtotals | • Auto Column Averaging |
| • Multiple Drives Supported | • Sorts in Minutes, Not Hours |
| • Menu Driven, User Friendly | • No Programming |
| • Multiple Files on One Disk | • Unlimited Backups |
| • State Model I or III, 48K Required | |

EXISTING OWNERS, WRITE FOR FREE UPDATE. ORDERS/INFO: 305-351-0428
Price \$69.95 VISA/MC Accepted FL Residents, Add 5% Tax

Supplied With Micro-Systems' TDOS
For Additional Information, Check
Reader Service or Write Direct to:

String Systems
1446 Hagen Lane
Rockledge, FL 32955 ✓443

TRS - 80 MODEL 100

TRS-80 is a trademark of the Tandy Corporation

Monthly magazine loaded with Software and Hardware Reviews, Useful How-to Tips, Program Listings, and Accessory Interface Suggestions for this unique new computer. Whatever your interest in this notebook size portable, this exclusive publication will help you realize its maximum potential while saving you money. Regular subscription rate is \$24/year [12 issues], however charter subscriptions are available for a limited time at \$19.00 for 6 months or \$16.00 for 12 months.  customers call 800-227-1617 ext 425
In California 800-772-3545 ext 425 or send check or Money Order to:

briefcase portable

560 South Hartz Avenue, Suite 447 • Danville, CA 94526

✓165

Adding an exclamation mark to a PKILL command causes the utility to zero the directory entry for each file killed, making it impossible to recover those files. PKILL also lets you use partspecs (part of a file name) when specifying file names. For example, the command PKILL :1,\$TEST kills all files from the drive 1 disk with names that begin with TEST.

PKILL's best feature is its speed. The program operates by reading a disk's directory into memory, killing whatever files you specify, then writing the newly modified directory back to the disk. This technique lets PKILL perform a complex file-killing procedure in little more than the time it takes to read and write a directory.

PKILL's flexible parameters and its speed make it a must-have for hard disk users. One or two passes through PKILL can take the place of a 10-minute disk clean-up session.

PCOMPARE is the disk or file comparison utility. Supply two file names or two drive numbers containing disks to be compared, and PCOMPARE "holds them up to the light, side-by-side" and tells you if the data on them is the same or different. If it's different, PCOMPARE tells you the position of the mismatch within the file or disk.

The program displays a summary at the end of the comparison that gives the number of sectors compared, the number of sectors not matching, and the number of bytes not matching.

The PFIND utility is a string search-and-replace program. It lets you locate and, if desired, replace strings in memory, within a single file, or on a disk-wide basis. You can supply the search string in one of four formats: case dependent (each specified letter must match exactly), case independent (specified letters can be in upper- or lowercase, or a mixture of both), in byte-list format, or in word-list format.

The last two formats let you search for a string of bytes or of 2-byte words. The program accepts byte or word values in binary, decimal, hex, or octal.

PMOVE is the ultimate file copier. It lets you transfer a number of files from one disk to another in one easy operation. PMOVE also lets you supply default file extensions.

Transferring files with PMOVE is much faster than with the LDOS Copy command. In my tests, performed on an unmodified Model III, transferring 10 small files (of fewer than three grans each) took three minutes using the LDOS Copy command, but only one minute and 30 seconds using PMOVE.

1. Cylinder xxx has an invalid GAT table byte
2. Hit byte at xxH invalid or extraneous
3. Filename contains non-ASCII characters
4. End of File Sector beyond allocated sectors
5. No terminator for extent field
6. Directory links to record not linking back to it
7. Track assigned that is beyond diskette boundary
8. Extension assigned before end of extents
9. Forward link to inactive entry
10. Forward link to non-extension entry
11. Extension record not assigned to any files
12. Multiple files assigned to single granule
13. Directory record has invalid HIT byte
14. Directory record has a zero HIT byte
15. Extended directory record has invalid HIT byte
16. Extended directory record has a zero HIT byte

Figure 2. PCHECK error messages.

```
:1 5" Floppy #2, Cyls= 40, Sides=1, Step=.06ms, Dly=.5s
00006 Free Grans, Name = LDOSDISK, Date = 05/03/83.
```

Cylinder 33 Has An Invalid GAT Table Byte.

Cylinder 34 Has An Invalid GAT Table Byte.

Cylinder 35 Has An Invalid GAT Table Byte.

Cylinder 36 Has An Invalid GAT Table Byte.

Cylinder 37 Has An Invalid GAT Table Byte.

00005 Total Errors.

Figure 3. A PCHECK error report.

This is another utility no hard disk owner should be without.

The PERASE utility turns your computer into a \$15 bulk eraser. It erases all data on a disk. A bulk eraser does the same thing as PERASE but faster, but bulk erasers sometimes extend their magnetic fields to include important disks located several feet away. PERASE only erases the disk you specify.

PDIRT lets you read Model III TRSDOS-formatted disks without leaving LDOS. You can specify that the directory listing include invisible files, system files, and system overlays. This utility does not work on a Model I that you haven't modified for double-density operation.

The PEX utility is a disk drive exerciser. It doesn't take your drives out for a walk on cold winter days, but it does give their stepper motors a workout. In its manual mode, PEX lets you position the head to a specified track. You can use this feature when aligning a drive.

In its automatic mode, PEX steps the head back and forth from track zero to the drive's highest-numbered track.

You can use PEX along with a head-cleaning disk, although The Toolbox documentation advises against using the automatic mode for more than 15-30 seconds.

PHELP, the largest program in The Toolbox, provides a summary of each LDOS library command and of the LBasic, Format, Backup, Conv, Patch, and Repair programs.

To use PHELP, type PHELP followed by a space, then the name of the library command. A short description of the command's purpose, use, and parameters appears and the program returns to the LDOS Ready prompt.

The descriptions in PHELP are clearly written, and most summarize the command as well as possible in one screen.

Some LDOS commands, such as System, DIR, and ATTRIB have many parameters and are too complex to describe completely on one screen. The summaries for these commands are more useful as memory joggers than as replacements for the LDOS manual.

Filters and a Fix

One of the features that sets LDOS

apart from other disk operating systems is its ability to filter a device. A device is anything attached to the computer that sends or receives data to or from the computer. Printers, disk drives, video monitors, and keyboards are typical devices.

The keyboard is an input device, since it supplies information to the computer. The video monitor and the printer are output devices, since they display and print information sent from the computer. The disk drive is an input or an output device, since it either supplies stored information to the computer or saves information sent by it.

LDOS lets you intercept and change the data going to or coming from a device. You might, for example, filter the printer to change the number of characters printed on each line.

You could also filter the keyboard so that entire sentences appear when you press a certain key. Filtering is a powerful feature you can use to overcome software or hardware limitations, or to make your computer easier to operate.

Three filters are included in The Toolbox package. The first, PMX/FLT, is for Epson MX-80 printer users. This filter adjusts the MX-80 graphics characters so that they print as normal

TRS-80 graphic characters. This lets you retain the special capabilities of the MX-80 that are otherwise lost when you put it in the TRS-80 mode.

Dvorak/FLT is a keyboard filter that lets you try the famous Dvorak simplified keyboard arrangement. This keyboard layout places frequently used keys in more logical positions than the standard QWERTY layout. Once

over again.

PFILT is a powerful filter you customize for your own applications. Unlike filters designed for a specific device, you can use PFILT with either input or output devices.

To use it, you must first create a translation file using the LDOS Build command, or any word processor that saves files in ASCII format. This file contains the information that tells PFILT what to do with the data it intercepts.

I put together a short filter file that I use to filter the output to my dot-matrix printer. This file lets me change type styles in the middle of text by simply pressing two keys.

Two sample filter files in The Toolbox illustrate the power of the PFILT filter. These files, called Code and Decode, are used to scramble and unscramble whatever you type when they are active. They're not of much practical value, but they help you figure out how to use PFILT for your own applications.

PBOOT is a patch that lets you customize, to a small degree, the appearance of the LDOS boot screen. PBOOT lets you add three 22-character message lines displayed next to that big

Filtering is a powerful feature you can use to overcome software or hardware limitations."

installed, you can alternate between Dvorak and QWERTY by holding down the clear key and pressing the zero key.

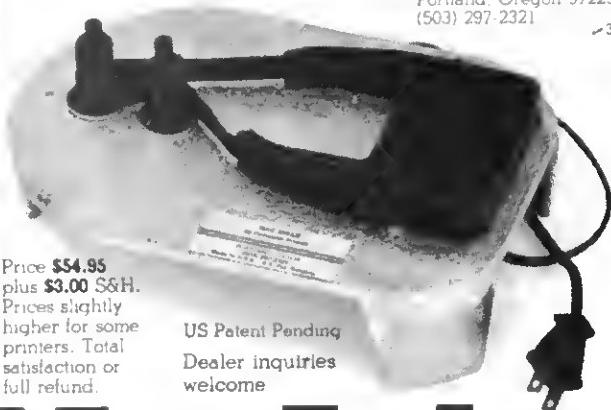
This filter does work, although I didn't spend much time experimenting with the Dvorak layout. I had a hard enough time learning where the space bar is; I'm not about to learn to type all

The Automatic Ribbon Re-Inker

Re-ink any type of ribbon (except carbon) for less than 5 cents.

Extremely simple operation. 1) Load cartridge or spool. 2) Add ink to reservoir. 3) Start motor.

We have a MAC INKER for any printer—many MAC INKER units support multiple printers. Ink contains lubricant for safe dot matrix printhead operation. Multicolored inks available. Ask for brochure.



Price \$54.95
plus \$3.00 S&H.
Prices slightly
higher for some
printers. Total
satisfaction or
full refund.

US Patent Pending
Dealer inquiries
welcome

Computer
Friends

100 Northwest 86th Avenue
Portland, Oregon 97229
(503) 297-2321

✓357

MacInker

COTTAGE SOFTWARE

PACKER. Machine language program that edits all or part of your Basic program to run faster, save memory, or ease editing. The 5 options include UNPACK—unpacks multiple statement lines into single statements maintaining logic, inserts spaces and rennumbers lines. SHORT—deletes unnecessary words, spaces, and REM statements. PACK—packs lines into maximum multiple statement lines, including all branches. MOVE—moves line or blocks of lines to any new location on program. On 2 cassettes for 16K, 32K, & 48K.

For TRS-80 Model I or III Level II or Disk Basic . . . \$29.95

SYSTEM TAPE DUPLICATOR. Copy your SYSTEM format tapes. Includes routine routines. The Model III version allows use of both 500 and 1500 baud cassette speeds.

For TRS-80 Model I or III Level II \$15.95

CASSETTE LABEL MAKER. A mini word processor to print cassette labels on a line printer. Includes 50 peel-and-stick labels on tractor feed paper.

For TRS-80 Model I or III Level II & Printer \$17.95

PRINT TO LPRINT TO PRINT. Edits your Basic program in seconds to change all Prints to LPrints (except Print@ or Print#) or LPrints to Prints. Save edited version.

For TRS-80 Model I or III Level II \$12.95

FAST SORT ROUTINES for use with Radio Shack's Accounts Receivable, Inventory Control I, and Disk Mailing List Systems for Model I Level II Sorts in SECONDS! You'll be amazed at the time you can save. Supplied on diskette with complete instructions.

FAST SORT for Accounts Receivable \$19.95

FAST SORT for Inventory Control I \$19.95

FAST SORT for Disk Mailing List (specify data diskette or cassette for 1 drive system) \$14.95

ALL THREE ROUTINES \$44.95

Prices subject to change without notice. Call or write for a complete catalog. Dealer inquiries invited. VISA and Mastercharge accepted. Foreign order in US currency only. Kansas residents add 3% sales tax.

On-line catalog in Wichita FORUM-80: 316-682-2113
Or call our 24 hour phone (316) 683-4811 or write:

COTTAGE SOFTWARE ✓187
614 N. HARDING
WICHITA, KANSAS 67208
TRS-80™ is a trademark of Tandy Corporation

LDOS that appears when you boot the system.

I found this patch a convenient way to mark my system disks. I have several LDOS system disks that I use, depending on what I'm doing—one for programming, one for word processing, one for telecommunications, and so on.

PBOOT lets me put a small message in each disk's boot screen. The message appears every time I reset the system, reminding me which system disk I'm using.

Using the Programs

All the programs in The Toolbox are parameter-driven, meaning that you have to type words and values to tell each program what to do, as opposed to selecting options from a menu. Parameter-driven programs are generally more difficult to learn because you have to either memorize each parameter or refer to the manual often.

Powersoft has, however, worked around this drawback. When a program runs, the screen clears, and the program's name, a copyright message, and a prompt for the parameters appears. If you press enter, you get a list of allowable parameters.

You can see this list any time during a

program's execution by pressing the enter key in response to the prompt. Although I still prefer menu-driven programs like Super Utility Plus, this method of providing on-line help works well.

All the programs in The Toolbox operate the same way—beautifully. The programs are carefully error-trapped. The screen displays are consistent and readable, and the error messages, while sometimes very technical, are complete. As an added touch, you can instruct the programs that display reports—disk maps, directory checks, and so on—to send data to the printer as well as to the screen.

Documentation

The manual that accompanies The Toolbox is adequate if you are very familiar with LDOS and with disk terminology in general. It was not written with the novice in mind. It assumes that you know what HIT and GAT mean, and what sectors and data address marks mean.

It doesn't warn the inexperienced computer user that one or two mistakes with a disk modification utility like PMOD can destroy the disk's contents. Finally, the manual is one of those run-it-off-right-justified-on-the-

daisy-wheel-printer-and-reduce-everything-50-percent jobs, and is, therefore, unattractive and difficult to read.

Who's It For?

This toolbox is definitely the craftsman's tool set. The programs in The Toolbox are error-free and work well with LDOS. They are powerful and easy to use, but you must have some knowledge of LDOS and of disk technical terminology, because the manual is geared for the expert user.

If you don't have any experience with disk and memory modification utilities, read one of the many books on the subject and experiment on some unimportant disks before working with valuable ones.

The file-moving and killing utilities are real time-savers. If you have a hard disk drive or several floppy disk drives, these gems are worth the cost of the package in themselves. In fact, at the new price of \$69.95 (these same programs used to sell for \$149.95), The Toolbox should be part of every LDOS user's system. ■

Jim Heid is a technical editor for Wayne Green Books Inc. Contact him c/o 80 Micro.

LEVEL IV PRODUCTS, INC.



** LEVEL IV MEANS FOUR LEVELS OF EXCELLENCE **
✓QUALITY ✓VALUE ✓SERVICE ✓SUPPORT



PREMIUM GRADE TRS80'S

BUILDING A PREMIUM GRADE MICROCOMPUTER IS A CLAIM FEW COMPANIES CAN MAKE, AND EVEN FEWER CAN BACKUP, WE DO IT EVERY DAY. EACH LEVEL IV COMPUTER SYSTEM IS CAREFULLY ASSEMBLED FROM PRE-TESTED COMPONENTS OF THE HIGHEST QUALITY, AND TESTED FOR PERFORMANCE TO A LEVEL FAR ABOVE THAT FOR WHICH IT WAS DESIGNED. AFTER BURN-IN, EACH UNIT IS DELIVERED WITH THE FAMOUS LEVEL IV 90 DAY LIMITED, PARTS AND LABOR WARRANTY (COPIES AVAILABLE ON REQUEST).

A LEVEL IV COMPUTER IS DESIGNED TO BE COMPLETELY COMPATIBLE WITH THE MOUNTAIN OF SOFTWARE AND HARDWARE READILY AVAILABLE FOR IT. ANY ITEM THAT WORKS ON OR ATTACHES TO, A STANDARD R/S UNIT WILL FUNCTION WITH OUR VERSION.

- 1) .40 AND .80 TRACK SINGLE AND DOUBLE HEAD DISK DRIVES
- 2) .1INCHESTER DRIVES 6.4 MEG THRU 31 MEG
- 3) CPU SPEED-UP MOD'S. MORE THAN DOUBLE YOUR SPEED
- 4) .80 COLUMN, 24 LINE DISPLAY, AND CP/M FOR MODS
- 5) MOD3 AND MOD4 DISK UP-GRADE AND MEMORY KITS

BUILDING A MOD3 OR MOD4 WITH THE ABOVE CAPABILITIES CERTAINLY MAKES IT A PREMIUM GRADE UNIT. BUT OUR MOST IMPORTANT PRODUCT IS AFTER-THE-SELL-SERVICE-AND-SUPPORT.

NOW FOR THE SURPRISE, BASE PRICE FOR OUR 64K MOD4 IS ONLY REMEMBER LEVEL IV MEANS ✓QUALITY ✓VALUE ✓SERVICE ✓SUPPORT SOME MAY BE CLOSE TO OUR PRICES, BUT NONE WILL MATCH OUR VALUES.



3 COMPANY STORE LOCATIONS:

MAIL & PHONE ORDER CENTER
32427 SCHOOLCRAFT ROAD
LIVONIA, MICHIGAN 48150

COMPUTER SALES CENTER
162 NORTH 20TH STREET
BATTLE CREEK, MICHIGAN

FULL LINE R/S SALES CENTER
134 SOUTH FRONT STREET
ODONNELL, MICHIGAN 49047

OUR 500,000+ INVENTORY OF ITEMS
FROM LEADING HARDWARE AND SOFTWARE MANUFACTURERS
WE ASSURE YOU PROMPT SERVICE
AT THE VERY LOWEST DISCOUNT PRICES



ASK ABOUT OUR
**BABA
BOLLARS
DISCOUNT PROGRAM**

CALL FOR OUR CURRENT LOW DISCOUNT PRICING
IN-STATE (313) 525-5200 OTHERS 800-521-3305
WE ACCEPT PAYMENTS BY VISA, M/C, CHECK, COD

YOUR ONE-STOP
COMPUTER
SHOPPING CENTER

The Artful Plotter

by Jerry O'Dell

Plot intricate, eye-catching figures on Radio Shack's plotter/printer. Programs like these convert even amateurs into artists.

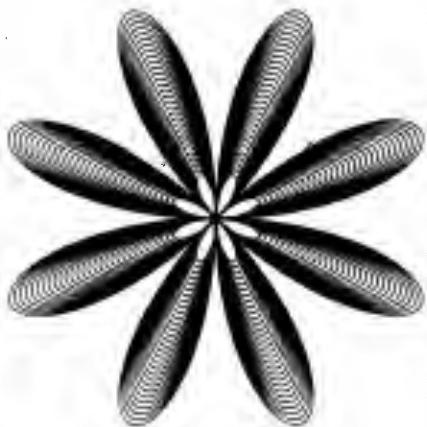


Figure 1. Classic rose curves.

When Radio Shack reduced the price of their plotter/printer (catalog number 26-1190A), I had to buy one. This digital plotter produces 8½- by 11-inch plots with a resolution superior to even the large, \$35,000 plotters of my college days. I've written some programs for the plotter that show off its high-resolution graphics in figures that are attractive and unique.

The plotter uses a ballpoint pen and thus isn't capable of doing work in India ink; that is not an insuperable drawback.

While I purchased the plotter for scientific purposes, I couldn't resist trying to make some intricate drawings. Since the manual provides only a few pro-

grams, I had to write my own. Some of the drawings were fascinating—almost beautiful. With proper modifications, these programs support almost any plotter; none of the features used are unique to my plotter.

The Programs

I consulted analytic geometry texts to learn how to create these figures. These books contain formulas for certain classic curves, such as those in the rose in Fig. 1. Many of these famous curves are defined in terms of polar coordinates. As such, they are difficult to draw on a printer, but are easily drawn on a plotter.

Plotters have a limited set of commands. Indeed, the programs in this article use only four true plotter commands found on virtually all plotters. In Program Listing 1, lines 20-50 establish certain constants for the rose. If you like, vary A to change the size and N to change the number of petals on the rose. The plotter connects to the computer's printer output and is addressed through LPRINT statements.

Line 60 puts the plotter in plotting mode, with LPRINT CHR\$(2). Line 70 is important. It reads:

```
70 LPRINT "G50X950Y0"
'MOVE TO NEW ORIGIN
```

This line moves the plotter pen to the

```

10 REM ROSE PROGRAM
20 A=100
30 N=4
50 C=57.29578
60 LPRINT CHR$(2)
70 LPRINT "G50X950Y0"
80 LPRINT "G03X0Y0"
90 FOR K=1 TO 30
100 A=A+15
110 FOR J=0 TO 360 STEP 1
120 TH=J/C
130 R=A*SIN(N*TH)
140 X=R*COS(TH):Y=R*SIN(TH)
150 LPRINT "G01X";INT(X);"Y";INT(Y) 'PLOT SEGMENT
160 NEXT J
170 NEXT K
180 LPRINT "G50X0Y0"

```

'CONSTANT 'NUMBER OF LEAVES 'RADIAN CONSTANT 'START PLOTTER 'MOVE TO NEW ORIGIN 'SET NEW ORIGIN 'OUTER LOOP 'INCREASE ROSE 'PLOTTING LOOP 'GET RADIAN EQUIVALENT 'GET RADIUS 'GET COORDINATES 'PLOT SEGMENT 'END INNER LOOP 'END OUTER LOOP 'RETURN TO ORIGIN
--

Program Listing 1

The Key Box

Model III
16K RAM
Basic
Plotter Printer



ONLY \$599⁰⁰
(Including 2 Diskettes)

THE NEW AMDISK-III MODEL III ADD-ON DRIVE

The AMDISK-III Micro-floppy disk system is an engineering breakthrough in disk size, storage capacity, media protection and user convenience. It's fully compatible with your TRS-80 Model-III.* Enjoy a full 736 KByte† (formatted) storage capability and the extra convenience of the new 3" hard-plastic encased diskettes. They fit into a shirt pocket and are easy to mail, too.

The AMDISK-III drive system is ruggedly constructed for years of trouble-free operation and is backed with our 90 day warranty on parts and labor.

Just circle the reader service number to receive full technical details.

*TRS-80 and TRS-80S are registered trademarks of Tandy Corporation.
†Requires recording in both sides.

DEALER INQUIRIES
INVITED

2201 Lively St., • Elk Grove Village, IL 60007
(312) 354-1180 TLX 25-4756

AMDEK CORP.

REGIONAL OFFICES: Calif. (714) 662-3949 • Texas (817) 432-2334

Amdek

your guide to innovative computing!

100

coordinates X = 950, Y = 0 with the pen up. Thus, a G50 command moves the pen without drawing a line. Line 80 reads:

```
80 LPRINT "G03X0Y0"
'SET NEW ORIGIN
```

It resets the pen's origin to the current position (here, X = 950, Y = 0). From this point on, all pen movements are compared (referred) to X = 950, Y = 0. The phrase G03X0Y0 instructs the plotter to use the current position as a new origin.

The remainder of the program, particularly lines 130–140, contains a complicated formula to draw the rose. Plotting takes place in line 150, which reads:

```
150 LPRINT "G01X";INT(X); "Y";INT(Y)
'PLOT SEGMENT
```

Statements like G01X50Y60 move the pen holder with the pen down, drawing a line from the present pen position to coordinates X = 50, Y = 60. Line 150 says the same sort of thing, but variables X and Y go into the print statement as they are calculated by the formulas. Thus, the first time you encounter line 150 the plotter draws a short line from the origin (where you last left the pen) to the first point on the curve. The second time you encounter line 150, the plotter extends the line segment of the curve. Notice that Fig. 1, then, is made up entirely of many short, straight lines.

You should have little trouble converting these programs so they work on your machine. In fact, the little \$250 plotter that Radio Shack has just begun to sell seems ideal for the amateur.

Listing 1 also shows the method used to draw the figures. The rose is actually drawn in lines 110–160, but since a sin-

gle rose isn't very interesting to the eye, I added the loop in lines 90 and 170 to

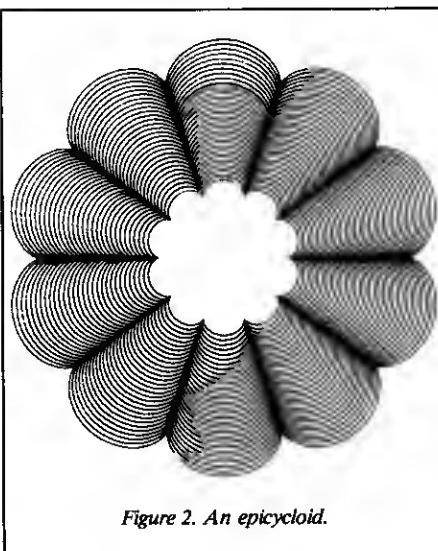


Figure 1. A fractal rose.

make the plotter draw several roses of ever increasing size. You can produce completely different figures by changing the numbers in lines 20, 30, and 100.

If the plot is a bit coarse for you, make the step smaller in line 110. Or, make the steps larger for fascinating, odd, angular figures, completely unlike the original.

I decided to plot an epicycloid, a curve traced by a point on a circle that rolls on the outside of a fixed circle (see Fig. 2). The epicycloid program is similar to the first program (see Program Listing 2).

Since it's used more than once, the function for the epicycloid is moved to a subroutine at line 200. This program introduces a new complication: While the rose began at the origin, the epicycloid begins at a distance from the origin. Consequently, in lines 110 and 120 you

```

10 REM EPICYCLOID PROGRAM 11/24/82
20 BR=150
30 FC=10
40 C=57.29578
50 LPRINT CHR$(2)
60 LPRINT "G50X950Y0"
70 LPRINT "G03X0Y0"
80 FOR K= 1 TO 30
90 BR=BR+10
100 LR=BR/FC
110 GOSUB 200
120 LPRINT "G50X";INT(X); "Y";INT(Y) 'MOVE THERE, PEN UP
130 FOR J=0 TO 359 STEP 1
140 PH=J/C
150 GOSUB 200
160 LPRINT "G01X";INT(X); "Y";INT(Y) 'PLOT SEGMENT
170 NEXT J
180 NEXT K
190 END
200 REM EPICYCLOID POINT ROUTINE
210 FT=BR+LR:XC=FT/LR 'GET CONSTANTS
220 X=FT*COS(PH)-LR*COS(XC*PH) 'GET X
230 Y=FT*SIN(PH)-LR*SIN(XC*PH) 'GET Y
240 RETURN

```

Program Listing 2

• DEALERS • DISTRIBUTORS • OEM'S •

- Enclosures and power supplies with or without drives.
- Low minimum orders.
- Attractive quantity pricing.
- Durable, textured, silver or off-white finish looks great on your display counter!
- Fully engineered product, high reliability design.
- Now available, half-height horizontal single enclosure, half-height vertical dual enclosure & optional filler plate.
- Ask about our new half-height horizontal dual 8" enclosure.

Ann Arbor Precision
7536 Jackson Road
Ann Arbor, MI 48103
Order Desk: 9-5 EST
(313) 426-5477 Mon-Thu

"Precision—Since 1977"

LOGICAL SYSTEMS AND YOUR MODEL 4 CREATE A FUNCTIONAL COMBINATION

LS-FED II 6.x (FILE EDITOR) — The ultimate "Zapping" utility with Visual Disassembler built in. File and/or track/sector oriented. Catalog #L-30-012.

only \$49.⁰⁰ plus \$3.00 Shipping & Handling

LS-FM 6.x (FILE MANAGER) — Conditional Parameterized, Move, Kill, Cross Examine, Create Secondary Action Files and Much, Much More. Catalog #L-30-051.

only \$49.⁰⁰ plus \$3.00 Shipping and Handling.

LS-TBA 6.x (The BASIC Answer) — TBA'S 5 Pass Text Processor allows structured programming for TRSDOS 6.x Basic. 14 character variables and Local variables (PSEUDO). No Line Numbers, use Labels instead, with Cross Reference System.

Catalog #L-21-011 only \$79.⁰⁰ plus \$4.00 Shipping & Handling

LS-HELP 6.x (BUILT IN 6.x TUTOR) — The Handiest Utility a New Model 4 owner could possibly have. Provides almost all the information needed to use the powerful features of TRSDOS 6.x. Catalog #L-30-061

only \$29.⁰⁰ plus \$3.00 Shipping & Handling.

Algorithms, error trapping, memory management, file I/O, etc. are included in the LS-HELP 6.x Tutor.

Unidad Logic, I Bytams, and other trademarks and service marks are used throughout.

* Prices and Specifications subject to change without notice.
** TRSDOS is a trademark of Tandy Corp. LS, LS-FED II, LS-FM, LS-TBA, LS-HELP, and all products and trademarks of LSI (The authors) are TRSDOS 6.x.

**LOGICAL
SYSTEMS
INC.**



13 TIMES FASTER THAN dBASE II™

If you bought your computer to save time, then you need SUPER, the most powerful database system you can use. Power is a combination of speed, ease of use and versatility. SUPER has them all.

FAST - To demonstrate SUPER's speed, ISA retained a professional dBASE programmer to benchmark SUPER vs. the acknowledged leader. A simple mailing list application was chosen to minimize dBASE programming cost. The results:

Task	SUPER Time	dBASE II Time
Set up/Program	5:20 min.	12:18:00 hrs.
Input 100 records	50:29 min.	1:27:50 hrs.
Sort & Print Labels	6:41 min.	4:18 min.
Totals	1:02:30 hrs.	13:50:08 hrs.

Notice that SUPER was faster at every task where *your time* is involved—and saving your time is probably the whole reason you bought a computer.

EASY TO USE - SUPER won because of its ease of use. Since it is menu-driven, office personnel can easily learn to use SUPER to set up their own applications, speeding and simplifying dozens of tasks without the need of programmer support.

VERSATILE - SUPER, unlike other business programs, doesn't dictate how to run your business. With SUPER the computer does *what you want, when you want, the way you want it*. **SUPER may be the only business program you'll ever need.** It can handle customer files, payables, receivables, depreciation, appointments, cost accounting, time charges, commissions, inventory, manufacturing control, and even matrix accounting systems!

SUPER PERFORMANCE AT A SUPER PRICE - That SUPER beats the \$700 dBASE program may surprise you, but in terms of price vs. performance SUPER has no competitors. Among its features are: production input, data compression, multiple databases on line, transaction posting, file reformatting, stored arithmetic files, flexible report formats, hierarchical sort and multi-disk files for up to 131,068 records. It can select by ranges, sub-strings, and field comparisons. It interfaces to word processors such as WordStar™, SuperSCRIPTSIT™, Model II/16 SCRIPTSIT™, and NEWSRIPT™. In fact SUPER has so many features that

it takes a six-page product description to cover them all. Write or call and we'll send you one.

SUPER is available for TRS-80™ Models I & III under NEWDOS™, LDOS™, and DOSPLUS; for TRS-80 Models II, III and 16 under TRSDOS™; and CP/M™ systems.

NOW \$199*

Manual (Price applicable to purchase)

Now available for IBM-PC

Manual (Price applicable to purchase) \$ 25.00

Now available for IBM-PC

*\$15.00 Formatting charge for non-standard CPM disk format

OTHER SOFTWARE

- ManageMint™: A PERT/CPM project management system compatible with SUPER. It includes scheduling, resource and financial management modules.
- Sales Planning and Data Extraction System: Improves hit rates while cutting costs.
- Small, economical program packages for accounting, business and office applications as well as utilities.

Write for Catalogue



Institute For Scientific Analysis, Inc.

✓351

SOFTWARE FOR HARD USE™

Dept. M-3 Institute for Scientific Analysis, Inc.
P.O. Box 7186 Wilmington, DE 19803 (215) 358-3735



ORDERS ONLY (800) 441-7680 EXT. 500



Trade mark owners: dBASEII - Ashton-Tate SCRIPTSIT, SuperSCRIPTSIT, TRSDOS, and TRS-80-Tandy Corp. NEWDOS/80 - Apparat, Inc. WordStar - MicroPro Int'l Corp. NEWSRIPT - PROSOFT LDOS - Logical Systems, Inc. CP/M - Digital Research

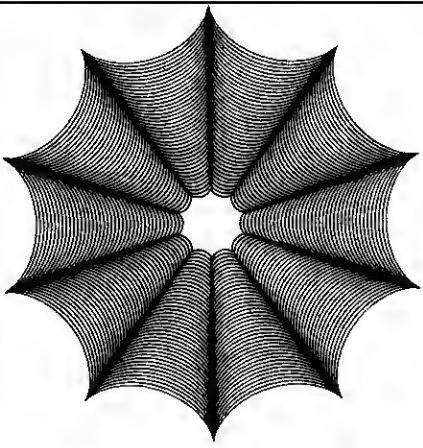


Figure 3. A hypocycloid.

must move the pen to the start of the figure or you'll have an ugly, unwanted line from the origin to the beginning of the curve. The remainder of the program is just like Listing 1; change the shape of the figure by changing the numbers in lines 20, 30, 90, and 130.

Sometimes small modifications in the formulas lead to significant changes in appearance (see Program Listing 3). By changing the values in line 20 to 100, and in line 90 to 15, and changing the step size in line 130 to 0.5, the plus sign in line 210 to a minus sign, and the minus

*"Sometimes small modifications in the formulas
lead to significant changes in appearance....
These figures remind one of a spider's web."*

```

10 REM HYPOCYCLOID PROGRAM 11/24/82
20 BR=100
30 FC=10
40 C=57.29578
50 LPRINT CHR$(2)
60 LPRINT "G50X950Y0"
70 LPRINT "G03X0Y0"
80 FOR K=1 TO 40
90 BR=BR+15
100 LR=BR/FC
110 GOSUB 200
120 LPRINT "G50X"; INT(X); "Y"; INT(Y) 'MOVE THERE, PEN UP
130 FOR J=0 TO 359 STEP 0.5 'PLOTTING LOOP
140 PH=J/C 'GET RADIAN EQUIVALENT
150 GOSUB 200 'GET COORDINATES
160 LPRINT "G01X"; INT(X); "Y"; INT(Y) 'PLOT SEGMENT
170 NEXT J 'END PLOT LOOP
180 NEXT K 'END OUTER LOOP
190 END
200 REM HYPOCYCLOID POINT ROUTINE
210 FT=BR-LR: XC=FT/LR 'GET CONSTANTS
220 X=FT*COS(PH)+LR*COS(XC*PH) 'GET X
230 Y=FT*SIN(PH)-LR*SIN(XC*PH) 'GET Y
240 RETURN

```

Program Listing 3

```

10 REM ELLIPSE PROGRAM
20 A=500
30 E=0.90
40 ST=1
50 C=57.29578
60 LPRINT CHR$(2)
70 LPRINT "G50X550Y0"
80 LPRINT "G03X0Y0"
90 FOR E=0.7 TO 0.98 STEP 0.015 'MULTI-ELLIPSE LOOP
100 TH=0 'SET ANGLE TO ZERO
110 GOSUB 200 'GET COORDINATES 1ST POINT
120 LPRINT "G50X"; INT(X); "Y"; INT(Y) 'GO THERE
130 FOR J=0 TO 360 STEP ST 'PLOT LOOP
140 TH=J/C 'ANGLE TO RADIANS
150 GOSUB 200 'GET COORDINATES
160 LPRINT "G01X"; INT(X); "Y"; INT(Y) 'PLOT LINE
170 NEXT J 'END PLOT LOOP
180 NEXT E 'END MULTI-ELLIPSE LOOP
190 END
200 REM ELLIPSE EQUATION
210 R=(A*(1-E*E))/(1-E*COS(TH)) 'ELLIPSE EQUATION
220 X=R*COS(TH):Y=R*SIN(TH) 'TO RECTANGULAR COORD
230 RETURN

```

Program Listing 4

sign in line 220 to a plus, you obtain the hypocycloid shown in Fig. 3.

A hypocycloid is drawn by a point on a circle rolling around the inside of a larger circle. These figures remind one of a spider's web.

Sometimes, even erroneous formulas of geometric figures produce nice results. In Fig. 4, I wanted to plot a set of ellipses, one inside another. But I used the wrong polar formula for the ellipse so the ellipses shifted a bit each time one was plotted (see Program Listing 4).

Basically, it's the same program as the others. Only the formula for the ellipse in the subroutine starting in line 200 is different, along with some other variables to set the size.

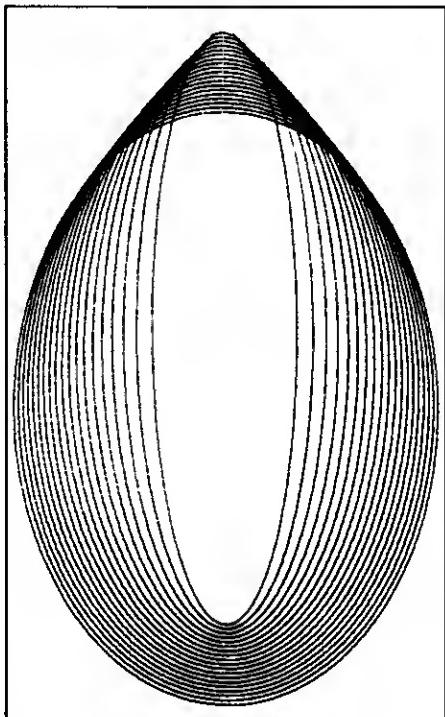


Figure 4. Shifted ellipses.

Some patterns just don't turn out the way you hope (see Program Listing 5). For example, Fig. 5 was supposed to provide some lovely moire' effects. Two circles are drawn, one on top of the other, with rays from the center. I don't like the way it turned out, though, and no amount of fiddling with the constants improves it. Listing 5 shows how this angry-looking plot was developed.

Finally, some patterns you think would be ideal for the plotter just don't work out. In the March 1982 issue of *80 Micro* (p. 112), Bob Boothe had some lovely figures, including a number of superimposed sine waves. A plotter does a great job plotting sine waves, so you would think that I could have surpassed Boothe's figure using Program Listing 6.

The result, Fig. 6, is disappointing—my plotter doesn't do as good a job as Bob Boothe's printer. The ball point pen doesn't seem to provide sufficient blackness. The constant pressure from the ball point pen wrinkles the paper, too. It takes about two hours to draw Boothe's Eye Killer, and the paper gets an awful workout during that time.

In all, however, I find the results of my little experiments pleasing. The programs to make these designs are short. Many more complex programs are available so that you can plot almost anything you want. ■

Jerry O'Dell is a professor of psychology at Eastern Michigan University, Ypsilanti, MI 48197.

EPSON FX-80/FT **\$565** (SHIPPING INCLUDED)

160 CPS 11 x 9 DOT MATRIX
GRAFTRAX-PLUS
SUPERSCRIPT/SUBSCRIPT
TRUE UNDERLINING
FRICTION AND TRACTOR FEED

ADJUSTABLE TRACTOR \$55
4K SERIAL BOARD (RS 232) \$150
APPLE II BOARD AND CABLE \$80
TRS 80 EXP INT CABLE \$25
IBM PC CABLE \$30

STAR GEMINI 10... \$370 \$350

BRUM ELECTRONICS

151-07 20 AVE

WHITESTONE, NY 11357

(212) 787-4353

ALLOW 2 WEEKS FOR PERSONAL CHECKS

CERTIFIED CHECKS

✓532

IMMEDIATE
DELIVERY

MONEY ORDERS

COD ADD \$2 NY RESIDENTS ADD TAX

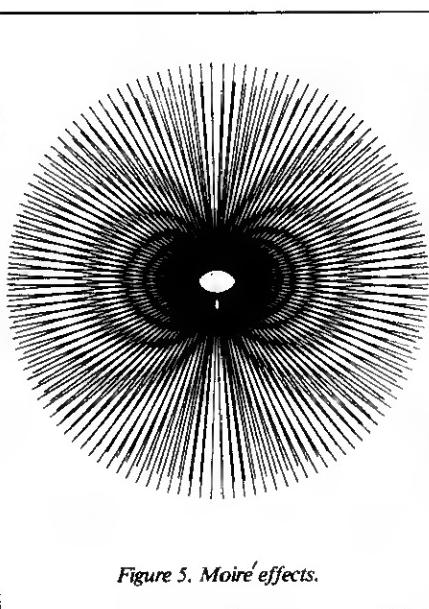


Figure 5. Moire' effects.

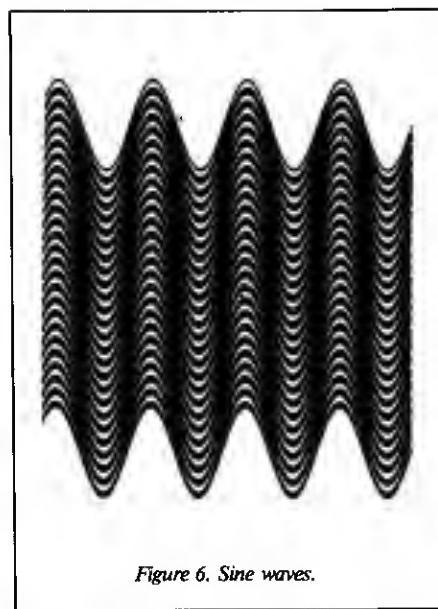


Figure 6. Sine waves.

```

10 REM DOUBLE RAY PLOTTER
20 C=57.29578
30 LPRINT CHR$(2)
40 LPRINT "G50X950Y0"
50 LPRINT "G03X0Y0"
60 DS=-20
70 FOR K=1 TO 2
80 FOR J=0 TO 359 STEP 3
90 X1=50*COS(J/C)+DS
100 Y1=50*SIN(J/C)
110 X2=500*COS(J/C)+DS
120 Y2=500*SIN(J/C)
130 LPRINT "G50X";INT(X1);"Y";INT(Y1)  'GO TO INNER POINT
140 LPRINT "G01X";INT(X2);"Y";INT(Y2)  'PLOT RAY
150 NEXT J
160 DS=20
170 NEXT K
180 LPRINT "G50X0Y0"

```

'RADIANT CONSTANT
'START PLOTTER
'MOVE TO NEW ORIGIN
'SET NEW ORIGIN
'SET DISPLACEMENT
'OUTER LOOP
'PLOTTING LOOP
'INNER X
'INNER Y
'OUTER X
'OUTER Y
'END PLOTTING LOOP
'SHIFT IMAGINARY ORIGIN
'END OUTER LOOP
'RETURN TO ORIGIN

Program Listing 5

```

10 REM EYE KILLER PROGRAM (AFTER BOOTHE)
20 HH=175
30 C=57.29578
40 LPRINT CHR$(2)
50 LPRINT "G50X200Y0"
60 LPRINT "G03X0Y0"
70 N=0
80 FOR J=1 TO 2000
90 N=N+1
100 IF N>50 THEN N=1
110 IF N<25 THEN 170
120 LPRINT "G50X0Y";INT(-J)
130 FOR X=0 TO 1400 STEP 5
140 Y=SIN(X/C)*HH-J
150 LPRINT "G01X";INT(X);"Y";INT(Y) 'PLOT CURVE
160 NEXT X
170 NEXT J
180 LPRINT "G50X0Y0"

```

'REM CURVE HEIGHT
'RADIAN CONVERSION
'START PLOTTER
'MOVE TO NEW ORIGIN
'SET NEW ORIGIN
'ZERO COUNTER
'OUTER PLOTTING LOOP
'BAND ALTERNATE COUNTER
'KEEP IN BOUNDS 1-50
'SKIP HALF
'RESET PEN TO START
'PLOT LOOP
'GET CURVE HEIGHT
'END INNER LOOP
'END OUTER LOOP
'RETURN TO ORIGIN (PEN UP)

Program Listing 6

Since 1978

- REPUTATION BACKED BY YEARS OF EXPERIENCE.
- PIONEER IN DIRECT TO CONSUMER SALES OF MICRO COMPUTERS AND ELECTRONICS
- MILLIONS OF DOLLARS IN SALES OVER THE YEARS
- TENS OF THOUSANDS OF CUSTOMERS
- HONEST
- RELIABLE
- LARGE INVENTORY
- NAME BRAND PRODUCTS



MicroManagement Systems, Inc.

2803 Thomasville Road East
Cairo, Georgia 31728
(912) 377-7120

DISCOUNT PRICES



BUY DIRECT

**It's simple. . . .
CALL & SAVE MONEY**

**1-800-841-0860
CONVENIENT ORDER ENTRY**

Ga & Infa 912-377-7120

TELEMARKETING WORKS FOR YOU

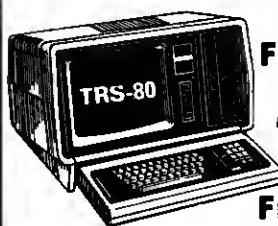
TRS-80 COMPUTERS

BUSINESS

DESK TOP

MODEL 16 TRS-80

\$3998
From 26-6004



MODEL 12 TRS-80
From 26-4004
\$2639

MODEL 4 TRS-80 COMPUTER

\$818
From 26-1067



HOME

PERSONAL

TRS-80 MC-10 MICRO COLOR



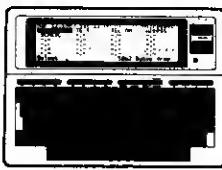
\$99

TRS-80 COLOR COMPUTER



SCALL

MODEL 100 PORTABLE TRS-80



\$677
From 26-3801

ALL PRODUCTS WE SELL ARE BRAND NEW AND COVERED BY THE MANUFACTURER'S SPECIFIC WARRANTIES. COPIES AVAILABLE UPON REQUEST.
WE DO NOT SELL ANY USED, RECONDITIONED, FOREIGN OR INFERIOR MODIFIED EQUIPMENT.
PRICES AND PRODUCTS SUBJECT TO CHANGE WITHOUT NOTICE.

WE CARRY THE COMPLETE TRS-80 COMPUTER PRODUCT LINE
•PURE RADIO SHACK EQUIPMENT

FREE UPON REQUEST

- DISCOUNT PRICE LIST AND INFORMATION KIT
 - COPY OF MFR'S WARRANTY
 - WRITE
- 96
MICRO MANAGEMENT SYSTEMS
TELEMARKET DEPT NO. 4
2803 THOMASVILLE RD. E. • CAIRO, GA. 31728

Aid for AIDS-III

by Amee Eisenberg

In March and April 1983, *80 Micro* published tandem articles on AIDS-III, a data management system (pp. 136 and 168, respectively). The software was sound, but after reading the articles I still didn't understand how to make the darned thing run. Many moons passed before I figured out the system. I'll give you the benefit of my insight.

The Automated Information Directory System (AIDS) comprises three parts: the field, the record, and the file. AIDS handles these parts in specific ways, but allows you an almost unlimited definition of them.

Fields are the smallest possible blocks of data. In the checkbook example cited in the AIDS articles, the fields are check number, dollar amount, payee, etc. Although this sample uses five fields, you can specify up to 12 fields.

Records are blocks of data made up of a set of fields. In AIDS-III, a single record contains the five fields used to describe the information on each check.

Files are blocks of data comprising a set of records. The number of records allowed in a file is determined by the amount of available memory.

**AIDS-III got you sty-
mied? Here are some
tips on how to use this
data management program.**

Running AIDS

To run AIDS, you must initialize Basic and reserve file space. Use the syntax "BASIC - F:n", where *n* is the number of files you want to open. I usually use three. You must initialize the files despite the default value of three files for Basic. Without initialization, a BAD FILE NAME error results in all attempts to write or read a file.

AIDS is not necessarily the system you think you see. It is flexible enough to let you modify it to suit your data management needs. You have to change a few lines of Basic code to configure AIDS. This is where imagination comes in. For example, say I need a system that keeps track of friends' birthdays so I can send greeting cards.

The procedure is simple. Lines 4990-5120 in the March AIDS-III program contain the data statements that create an AIDS system. List these lines and study the remarks associated with them. Change the lines according to your needs. In my case, for instance, I need names, addresses, and birth dates. While I was at it, I decided to file phone numbers as well. My address system appears in Fig. 1.

Save the AIDS program with your custom system configuration under its own name. This way, you can refer back to the original system any time you need to create a new AIDS system.

Once you've created your system, the next step is getting your data in and out of it on demand. Run your AIDS system. After the initial AIDS message is displayed, the program displays your system and the menu options on the screen (see Fig. 2).

If you are developing a new system, the only menu option applicable is Add Records. Add your data, then return to the main menu (press the shift and up-arrow keys simultaneously). See Table 1 for the AIDS control keys. One note: AIDS does not accept lowercase input.

To save the information just added, choose the Select & Save Records op-

```
5000 DATA AMEE'S ADDRESS SYSTEM
5010 DATA 5: 'NUMBER OF FIELDS COMPRISING A RECORD
5020 DATA NAME: 'NAME OF FIELD #1
5030 DATA 25: 'NUMBER OF CHARACTERS IN FIELD #1
5040 DATA STREET: 'NAME OF FIELD #2
5050 DATA 25: 'NUMBER OF CHARACTERS IN FIELD #2
5060 DATA TOWN, ETC: 'NAME OF FIELD #3
5070 DATA 25: 'NUMBER OF CHARACTERS IN FIELD #3
5080 DATA PHONE: 'NAME OF FIELD #4
5090 DATA 14: 'NUMBER OF CHARACTERS IN FIELD #4
5100 DATA BIRTHDAY: 'NAME OF FIELD #5
5110 DATA 7: 'NUMBER OF CHARACTERS IN FIELD #5
```

Figure 1. Lines inserted in AIDS-III to keep track of names, addresses, birth dates, and phone numbers.

- 1—SELECT & LOAD RECORDS
- 2—ADD RECORDS
- 3—SORT RECORDS
- 4—SELECT & UPDATE RECORDS
- 5—SELECT & DELETE RECORDS
- 6—SELECT & PRINT RECORDS
- 7—SELECT & SAVE RECORDS
- 8—WRITE DESCRIPTOR FILE
- 9—QUIT, ALL DONE

Figure 2. AIDS-III menu options.

FOR WINNERS ONLY



PROFESSIONAL FOOTBALL ANALYSIS SYSTEM

THE MOST COMPREHENSIVE SYSTEM — NOW AVAILABLE FOR 1983

At the controls of the most sophisticated football analysis software, your personal computer can make the upcoming football season the most exciting ever!

GRIDSTAR™, the professional football analysis system, is comprised of four main components:

* PROFESSIONAL FOOTBALL DATA BASE — File comprised of 2184 regular season games, 1973 to 1983 inclusive.

* DATA BASE MANAGER — Comprehensive utility to display, edit, and search your Data Base.

* WEEKLY HANDICAPPER — This program handicaps a full week of games using the GRIDSTAR™ STRATEGY

* GRIDSTAR™ DEVELOPMENT PROGRAMS — All programs used to develop and test the GRIOSTAR™ STRATEGY.

Professional Football Data Base

At your disposal, a complete history of America's No. 1 Sport — 11 years of game data. Each 16-byte game record includes home and away teams, home and away scores, the closing line, day, week and date.

Data Base Manager

To keep your Data Base current for years to come, full EDIT FUNCTION allows you to change or add any game record. The sophisticated DISPLAY MODE lets you scroll up and down through your Data Base. The extensive SEARCH FUNCTION is a serious analytical tool. Set any combination of 20 search parameters and invoke a search for qualified games. Automatic won/loss analysis can be instantly displayed.

Weekly Handicapper Using the GRIDSTAR™ STRATEGY

This is your Sunday morning predictor program. The program applies the GRIDSTAR™ STRATEGY to each upcoming game and tells you which teams to bet. It will indicate 5 to 10 bets each week determined by the five analysis angles of the GRIDSTAR™ STRATEGY. Your only responsibility is to keep the Data Base current, by keying in the lines and scores each week.

The GRIDSTAR™ STRATEGY

Employing advanced statistical techniques, our development team has researched numerous methods of predicting winners against the spread. Of these, five approaches proved effective enough to be incorporated into the GRIDSTAR™ STRATEGY

- POWER RATING ANALYSIS
- STREAK ANALYSIS
- POINTSPREAD ANALYSIS
- HEAD-TD-HEAD ANALYSIS
- MONDAY NIGHT ANALYSIS

Each of the above approaches, taken separately, has proven to be a consistent winner. But when combined into a comprehensive handicapping system, the GRIDSTAR™ STRATEGY, the results have been consistently spectacular, year after year. The following table presents the GRIDSTAR™ STRATEGY's record versus the spread over the last decade.

THE GRIDSTAR™ STRATEGY 10-YEAR PERFORMANCE VS. THE SPREAD

	Games	Win	Loss	Tie	Pct
1973	116	76	43	0	.653
1974	107	69	37	1	.650
1975	100	63	36	1	.637
1976	100	71	31	4	.720
1977	130	77	43	10	.631
1978	126	75	46	1	.615
1979	119	94	59	4	.844
1980	131	90	37	4	.702
1981	148	81	52	3	.559
1982	117	74	23	0	.636
TOTAL	1195	742	416	37	.638

Performance Absolutely Verifiable

All the programs used to develop the GRIOSTAR™ STRATEGY are included in the package. You can run these programs, verify the results, and trace the entire developmental process. The seven strategy development programs not only provide proof of performance, but can form the basis for further research.

Complete Documentation

The accompanying OPERATIONS MANUAL is extensive. Over 100 pages of text take you through the Data Base layout, operation of each program, and the fine points of computer sports analysis. Over 30 charts and illustrations highlight the presentation.

System Requirements

TRS-80® MDD I or MDD III, 48k, 1 Drive
IBM PC™, 64k, 1 Drive

Every program in the GRIDSTAR™ package is in BASIC, structured, modular, and fully commented. Easy to use, each program is user-friendly, menu-driven, with air tight error-trapping.

Complete Package \$195.00

* Registered Trademark of Tandy Corporation

** Registered Trademark of IBM Corporation


7777 Keele Street, Unit 8
Concord, Ontario, Canada
L4K 1Y7

✓ 358

ORDER BY MAIL or PHONE: (416) 738-1700

GridSoft Inc., 7777 Keele Street, Unit 8, Concord, Ontario, Canada L4K 1Y7

Yes! Rush me the complete GRIDSTAR™ package at a cost of \$195.00.

Please check program required: IBM PC™ TRS-80 MDD. I* TRS-80 MDD. III*

Dealer Inquiries Invited

Name _____

Address _____

City _____ State _____ Zip _____

Card Number _____ Expiry Date _____

Signature _____ Check Money Order Visa MasterCard

SELECT & PRINT RECORDS BY "NAME"			
= EQUAL	< LESS THAN	- LESS OR EQUAL	+ GTR OR EQUAL
# NOT EQUAL	> GTR THAN		
CHOOSE RELATION:			

Figure 3. AIDS-III logical operators.

Enter	Entry complete, accept data
Up arrow	Skip back to previous entry line
Shift/down arrow/Z	Skip forward to next entry line
Left arrow	Backspace, erase last character
Right arrow	Right-justify entry data
Shift/up arrow	Skip back to previous entry screen
Shift/down arrow	Skip forward to next entry screen
Shift/left arrow	Erase entire contents of entry line
Shift/right arrow/Y	Restore line to original contents
Clear	Cancel action, exit to previous action

Table 1. AIDS control keys and their functions.

tion. This asks you to select which records you want to save. Then it asks for the name of the saved file. You may create a new file, or save the selected records to a file previously created by your AIDS system. Your system writes to the files it creates, not to files created by a different AIDS system. For in-

stance, my address system won't write information to a file created by the AIDS-III checkbook management system.

With all "SELECT &" menu options, you control two parameters. First, you choose the field, and second, you choose a logical operator by which selections are sorted. For example, if I wanted a printout of all the names in my address system, I would choose field A (Name). The logical operators from which I choose appears in Fig. 3.

I'd then ask the computer to print out those names not equal to (#) Z. Then (providing I'm not best buddies with someone who goes by the moniker "Z") I'd get all the names in my address system.

Alternatively, if I needed to know whether any of my friends had a birthday today, I'd use the Select & Print option and field E (birthday) all those birthdays equal to (=) today's date. Then, if anyone's name was displayed, I'd send them a card.

Running Maps, CALCS, and Merge

Option 8 on the main AIDS menu is Create Descriptor File. Descriptor files become important when (and only when) you wish to use the files you've created in your AIDS system with some AIDS subsystem such as Maps, CALCS, and/or Merge. These programs appear in the April 1983 *80 Micro* (p. 168) and are designed to manipulate previously created data files in ways beyond the simple sorts of which AIDS is capable.

Create Descriptor File writes a file that contains the system configuration of your AIDS system. This tells the subsystem programs what to expect when

A-T	Print contents of specified field
.	Print 1 blank space
:	Print 5 blank spaces
:	Print 10 blank spaces
!	Print 20 blank spaces
/	Skip down 1 line
%	Skip down 5 lines
#	Skip down 10 lines

Table 2. Maps-III user-defined format specifiers.

they read a file from your AIDS system. The Address/DSC descriptor file that I created from my address system indicates that my system is called Amee's Address System, that each record has five fields, and the names and lengths of those fields.

When first run, the AIDS subsystems ask for the descriptor file name. Once the descriptor file has configured the subsystem program, it can then read any other AIDS system file created according to the descriptor file format.

Maps, for example, reads selected files or records and offers three ways to print your data: Print Down Page, Print Across Page, or Print User-Defined Format. The user-defined formats let you sort the fields so you can print data records in any format you choose. In my address system, a user-defined format of A/B/C (field A, skip down one line, field B, skip down one line, field C) creates a mailing label. See Table 2 for the Maps format specifiers.

CALCS is a subsystem that allows you to do some numerical calculations with the data in its files. You may create two formulas and process any field or record through either of those formulas.

Merge manipulates files and records to create lists defined by specified parameters. One nice feature for people working on mailing lists is that Merge searches out and deletes duplicate records. That could save a lot of money by preventing the same person from getting two or three of the same brochure.

In Closing

This article attempts to help you figure out AIDS. It is by no means comprehensive. AIDS is a large and versatile system. But, if you read the March and April articles and play with the system a little, I think you can get a good handle on using AIDS. ■

Contact Amee Eisenberg, c/o 80 Micro, 80 Pine St., Peterborough, NH 03458.

\$\$ PRINTERS \$\$	
EPSON	
MX 80	Lowest Prices in USA
MX 80 FT III	
MX 100 FT III	
FX 80	
STAR MICRONICS	
Gemini 10	\$329
Gemini 15	509
C. ITOH	
8510 Prowriter Parallel ..	\$385
8510 Prowriter Serial ..	569
1550 Parallel ..	669
1550 Serial ..	749
\$\$ Letter Quality Printers \$\$	
SMITH CORONA TP-1...	\$549
COMREX-CRI	825
SILVERREED	629
NEC 3510	1499
Interfaces with Cables ..	69
Shipping and Handling, Add 3%.	
Credit Cards Add 3%.	
CA Residents Add 6%.	
THE COMPUTER STORE	
Dept. #345 • 3941/B South Bristol St.	
Santa Ana, CA 92704	
714-662-1425	



SUPER SOFTWARE FOR THE TRS 80 MODELS II, III, 4, 12, and NOW MODEL 16

- S P E C I A L -

MAKE YOUR MODEL III OR MODEL 4, IBM-PC COMPATABLE!

under the UCSD p-System. Read and write IBM-PC p-System disks with the:

Model III p-System AND Holmes Engineering VID 80 (tm)
Board (SAVE \$40 - WAS \$635) \$595
Gives you 64K and 80 x 24 screen (compiler separate)

AND JUST RELEASED!!!

Model 4 p-System \$650
Full development system, choice of compiler

THE UNIVERSAL OPERATING SYSTEM

UCSD p-SYSTEM

Version IV.1 - Full development system includes:
Full screen editor, file handler, interpreter, assembler and linker. Over 1000 pages of documentation.

Radio Shack Model II, t 12t \$650
Radio Shack Model II, t 12t w - Corvus interface \$850
t - comes standard with Pascal compiler
Radio Shack Model 16t (68000 side, Ram disk) \$850

t - choice of compilers

Compilers also available separately:

Pascal \$375 Fortran \$350
Basic \$225
Lisp Interpreter \$100

UTILITY PROGRAMS

Operating system format exchange programs

Convert data and text files from one OS format to another.

TRS DOS to p-System \$100
CP/M to p-System \$100
IBM 3741 to p-System \$286

A P P L I C A T I O N S P R O G R A M S -

DATEBOOK - Appointment Scheduling

Personal DateBook -

Format available for 9 persons \$150

Datebook II - Format available for 27 persons \$295

MILESTONE - Project, Time Scheduling.

Up to 300 activity subroutines with over 30,000 time units. Best features from PERT (program evaluation and Review Technique) and CPM (Critical Path Method)

EPICS - Executive Planning

Includes Schedule Overview, Personal Scheduler, Document Tracking System, Tickler File, Index Scheme, Name & Address File, Questionnaires/Data Tabulator, Personal Analysis Management System, and Project Planning Tool

IMP - Instant Mathematical Programming

Program generator used to solve simultaneous linear & nonlinear equations, linear programming problems and others. Designed for engineers, scientists & mathematicians.

UTILITY PROGRAMS (Continued)

Disassemblers - Z80, 6502, 68000	\$100
Corvus Hard-disk Drivers - 5, 10, 20 MB	\$200
MOD II, 12 (Watch for III, 4 and 16 drivers soon!)	
PFAS - Keyed ISAM file handler	\$225
ASE - Advanced System Editor	\$150
Programmable function keys, disk based file area	
CRTForm (tm) - The Bug Killer	\$450
Let your computer generate your screens & I/O source code.	

SOFTWARE PRODUCTS

INTERNATIONAL

A family of FULLY integrated software packages



LogiQuest III - Relational Data Base	\$495
65 fields/record, 15 sort/find criteria	
Create & work with virtual files from multiple data bases	
ProCalc - Financial Planning	\$350
Allows extremely large models, disk based data base	
Asset - Accounting	\$1250
Sophisticated accounting package, GL, AR, AP, IC	
Interfaces with LogiQuest, ProCalc & LogiCalc	
Modules available separately (each)	\$390
DBtool interface	\$695
Allows you to write programs which will interface to the data base of all the above programs.	

LOGICALC

Financial modeling & spreadsheet

A superb spreadsheet that goes well beyond others at a superb price. This is the spreadsheet chosen by IBM for their own sales force to sell. For the:

Models II, III, 4, 12 . Was \$190 . . NOW . . \$98
Model 16 \$190

PDBASE - Database Management

Uses English-like commands to review and display the data base. Procedure files can be stored; data security allows levels of access.

CPR - Text Formatter

Designed for use with UCSD p-System text editor or Advanced System Editor for maximum control over raw text formatting & printing

Nutri-Calc (tm) (PRICE CUT 60%)

Allows you to manage diets of any number of people, calculates caloric intake, stores recipes & menus, and computes schedules for weight loss or gain.

MAILER

More than just another mailing list. Allows mail-merge with form letters you prepare yourself.

CAN ELIMINATE THE NEED FOR AN ADDITIONAL PROCESSOR IN MANY CASES!

* trademark of Tandy Corporation.

PCD Supports Systems Software on DEC LSI-11, Radio Shack Models II, 3, 4, 12 & 16, Altos, Terak, IBM PC, Apple II +, & Sage.

* UOS is a trademark of SoftTech Microsystems.

UCSD p-System is a trademark of the University of California.

IBM is a trademark of International Business Machines.

Vid BO is a trademark of Holmes Engineering.



COD or MONEY ORDER

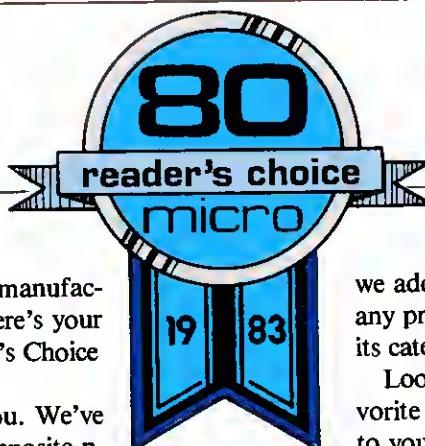
PCD Systems, Inc.

P.O. Box 143

Penn Yan, N.Y. 14527

(315) 536-7428

80micro's SECOND ANNUAL READER'S CHOICE AWARDS



All year long, you have to listen to manufacturers tell you which software is best. Here's your chance to tell *them*, with the 1983 Reader's Choice Awards.

This year, we've made it easier for you. We've printed the ballot on the bind-in card opposite p. 226; you don't have to tear out a page from your magazine to vote. To avoid ballot stuffing, we can accept only original cards—no photocopies please.

The entries in this year's poll were compiled from manufacturers' responses to a questionnaire. To this list,

we added last year's first place winners, as well as any product that received 10 percent of the vote in its category.

Look through the entrants, and select your favorite software in each category that applies to you. Write the numbers of your choices on the ballot. If your favorite program isn't on the list, write in its name and manufacturer. All past and present commercial software packages are eligible.

The deadline for returning ballots is Oct. 7, 1983. We'll publish the results in January. ■

Model I/III Software

I/III—Accounting

1. Accounting Program (McClintock Corp.)
2. Accounting Software (Compumax Associates)
3. Accounts Payable (MAS80)
4. Accounts Payable (Radio Shack)
5. Accounts Payable (Taranto & Associates)
6. Accounts Payable (Universal Data Research)
7. Accounts Receivable (Holman Data Processing)
8. Accounts Receivable (MAS80)
9. Accounts Receivable (Radio Shack)
10. Accounts Receivable (Taranto & Associates)
11. Accounts Receivable (Universal Data Research)
12. ACCT (Micro Architect)
13. Amortization (Rockware Data Corporation)
14. Annrose A/R (Sturdivant and Dunn)
15. Balanced Billing (Universal Data Research)
16. Cashbook (Coolidge & Associates)
17. CBook (Contract Services Associates)
18. Check Register (MAS80)
19. Church Contributions (Universal Data Research)
20. Cycle Billing System (Computer Shack)
21. Data Train's "The Accountant" (Thoughtware Publishing Company)
22. Datagraph (Micro Software Systems)
23. Expense Ledger (Manhattan Software)
24. Fixed Assets (Dep/Acres) (Nepenthe Programs)
25. Flying Club Management System (Communications Systems Laboratories)

26. General Ledger (Universal Data Research)
27. General Ledger (MAS80)
28. General Ledger (Taranto & Associates)
29. General Ledger (Holman Data Processing)
30. GL80 General Ledger (AT-80)
31. Intermediate Bookkeeper (Sturdivant and Dunn)
32. Inventory (McClintock Corp.)
33. Inventory Control (Taranto & Associates)
34. Inventory II (Universal Data Research)
35. Invoicing (MAS80)
36. Job Cost Control (McClintock Corp.)
37. Lynn's Accounts Receivable System (Joe Lynn Computer Services)
38. Lynn's Payroll System (Joe Lynn Computer Services)
39. Max! CRAS (Adventure International)
40. Non-Disk Check System (Futureview)
41. Non-Disk Electric Bookkeeper (Futureview)
42. Payroll (McClintock Corp.)
43. Payroll (Radio Shack)
44. Payroll (Taranto & Associates)
45. Payroll (Universal Data Research)
46. Payroll (Write-up only) (Nepenthe Programs)
47. Quick Check (Chuck Atkinson Programs)
48. Repeat Billing (MAS80)
49. SBSG Accounts Payable (Small Business Systems Group)
50. SBSG Accounts Receivable (Small Business Systems Group)

51. SBSG General Ledger (Small Business Systems Group)
52. SBSG Inventory (Small Business Systems Group)
53. SBSG Invoicing/Order Entry (Small Business Systems Group)
54. SBSG Payroll (Small Business Systems Group)
55. Schedule K-1 Manager (Empire Software)
56. Single Entry General Ledger (Universal Data Research)
57. Small Business Accounting (Howe Software)
58. Supertax (Rockware Data Corporation)
59. Taxhead (Sturdivant and Dunn)
60. TaxPal (Videotronics of Sarasota)
61. Taxplan (Contract Services Associates)
62. Taxpro (Contract Services Associates)
63. Viz-A-Con (Abacus Associates)

I/III—Business

1. Accounts Payable (Nepenthe Programs)
2. Accounts Receivable (Nepenthe Programs)
3. ACNAP (BV Engineering)
4. Advanced Opvalu (Star Value Software)
5. AgriStar (Radio Shack)
6. Amway Business Manager, The (Manhattan Software)
7. APL★Plus (STSC)
8. BizGraph (Micro-Labs)
9. Bill of Materials Processor (ELTECH Associates)

10. Budget Management (Radio Shack)
11. Buiness Analysis (Instant Software)
12. Business Mailing List (Radio Shack)
13. Caseate Mailing List (Radio Shack)
14. Check Register Plus (SoftCo)
15. Checkwriter (Radio Shack)
16. Church Attendance (Custom Data)
17. Church Donations (Custom Data)
18. Client Files (Coolidge & Associates)
19. Commercial Cooling & Heating Load (McClintock Corp.)
20. Construction Spreadsheet Templates (Software Models)
21. Cycle Analysis (Mar-Tec Stock Market Software)
22. Datagraph (Micro Software Systems)
23. DesktopPlan 80 (Radio Shack)
24. Directory for Churches (Custom Data)
25. Easy Calc (Instant Software)
26. Enigma—An Unbreakable File (Casier Computing)
27. Executive Calculator—150 Business Progra (MCS Software)
28. Executive Scratch Pad (Software of the Future)
29. Finance Spreadsheet Templates (Software Models)
30. Food Service Cost Estimating (Nepenthe Programs)
31. Heating Fuel Cost (McClintock Corp.)
32. Inventory Control I (Radio Shack)
33. Inventory Master (Logical Systems)
34. Investor III (Good Software Corp.)
35. Invoicem (Computer/Business Services)
36. Invoicer (Computer/Business Services)
37. Job Costing (ELTECH Associates)
38. Labor Collection/Performance (ELTECH Associates)
39. Life Cycle Cost (McClintock Corp.)
40. Loan Amortization (Precision Prototypes)
41. Loan Calculator (Software of the Future)
42. Loancomp (Contract Services Associates)
43. Lynn's Accounts Receivable System (Joe Lynn Computer Services)
44. Lynn's Check Register System (Joe Lynn Computer Services)
45. Lynn's Payroll System (Joe Lynn Computer Services)
46. Mail (Micro Architect)
47. Mail List Manager (Manhattan Software)
48. Mail/File Series II (Logical Systems)
49. Mailing List (Howe Software)
50. Mailing List System (Precision Prototypes)
51. Manufacturer's Cost Estimating (Nepenthe Programs)
52. Manufacturing Inventory Control (Radio Shack)
53. Mar-Tec Charts (Mar-Tec Stock Markt Software)
54. Mar-Tec Moving Averages (Mar-Tec Stock Market Software)
56. Maxi Mail (Adventure International)
56. Manufacturing Inventory Control (ELTECH Associates)
57. Minibit Bookkeeping System (Nepenthe Programs)
58. Momentum Analysis (Mar-Tec Stock Market Software)
59. Money Decisions, Volume 1 (Eagle Software Publishing)
60. New Interactive Computing Environment (XYZT Computer Dimensions)
61. Nilvoice (Computer/Business Services)
62. Non-Disk Check System (Futureview)
63. Non-Disk Electric Bookkeeping (Futureview)
64. Non-Disk Sales/Inventory (Futureview)
65. NutriCalc (PCD Systems)
66. Options-80 (Options-80)
67. OptionVue (Star Value Software)
68. Opvalu (Star Value Software)
69. Order Entry & Invoicing (Nepenthe Programs)
70. Payroll (Full Service) (Nepenthe Programs)
71. Pers-A-Mail (SoftCo)
72. Personnel Manager (Radio Shack)
73. Personnel Program (Software of the Future)
74. Postman Mass Mailing System (Soft Sector Marketing)
75. Powermail (Powersoft Products)
76. Project Cost Control (Nepenthe Programs)
77. Project Manager (Radio Shack)
78. Purchasing Control (ELTECH Associates)
79. Quick Register (Chuck Atkinson Programs)
80. Real Estate I (Radio Shack)
81. Real Estate II (Radio Shack)
82. Real Estate III (Radio Shack)
83. Real Estate IV (Radio Shack)
84. Real Estate Spreadsheet Templates (Software Models)
85. Shop Order Control (ELTECH Associates)
86. Small Business Management (Howe Software)
87. Statistician, The (Quant Systems)
88. Stockvue (Star Value Software)
89. Tailmaater (Prosoft)
90. Tickertec (Max Ute & Company)
91. Time Manager (Radio Shack)
92. Titlemaster (Sykam Systems Limited)
93. Trend Analysis Program (Harley D. Wilbur)
94. Using VisiCalc TRS-80 Set (John Wiley & Sons)
95. Video Library (Software of the Future)
96. VisiCalc (VisiCorp)
97. VMAIL (Vinzant & Associates Software Division)

I/III—Data-Base Management

1. Alde-III (SoftTrend)
2. Data Base Manager (Universal Data Research)
3. Data-Writer (Software Options)
4. Dataman (A String Systems)
5. Datamaster (Micro Corp.)
6. DBM5 The File Clerk (ComSoft)
7. Disk Listmaker (Manhattan Software)
8. ENB (Allen Gelder Software)
9. DBM (Micro Architect)
10. In-Memory Database Management (Howe Software)
11. Information Storage and Retrieval System (Dezoyea Enterprises)
12. InfoScan (The Smallsystem Center)
13. Instant Sort/Search (Acorn Software Products)
14. KSoft (LOG Electronic Notebook)
15. Library Support Option (XYZT Computer Dimensions)
16. Magnum (Howard W. Sams & Co.)
17. Mail Manager/Label Maker I (Empire Software)
18. Management System II (Micro-80)
19. Maxi Manager (Adventure International)
20. Maxi Utility (Adventure International)
21. Memory Jogger (Micro Software)
22. Producer (Software of the Future)
23. Producer Junior (Software of the Future)
24. Profile (Radio Shack)
25. Profile of Church Members (Custom Data)
26. Profile III Plus (Radio Shack)
27. Teacher's Grade Book (Software of the Future)
28. VIEW The Magic Dot (ComSoft)
29. "Word" Processor, The (Bible Research Systems)

I/III—Data Communications

1. Advanced Baudot Radio Teletype (Richcraft Engineering Ltd.)
2. Advanced Synchronous Packet Radio (Richcraft Engineering Ltd.)
3. Bullet, The (Vinzant & Associates Software Division)
4. Connection-80 BBS (B.T. Enterprise)
5. Electronic Messenger (B.T. Enterprises)
6. Electronic Messenger (Philadelphia Consulting Group)
7. Filexfer (Computer Applications Unlimited)
8. Forum-80 (Small Business Systems Group)
9. IntellTerm (Micro Corp.)
10. Lync (International Software Alliance)
11. Modem 80 (Alternate Source)
12. Mousenat (Small Business Systems Group)
13. Newterm/80 (Apperat)
14. Omniterm (Lindbergh Systems)
15. On-Line 80 BBS (Stewart Software)
16. Packet Radio—Software Approach (Richcraft Engineering Ltd.)
17. Smart Terminal (Howe Software)
18. Softcomm (Stewart Software)
19. ST80-CC (Small Business Systems Group)
20. ST80-DUC (Small Business Systems Group)
21. ST80-III (Small Business Systems Group)
22. ST80-UC (Small Business Systems Group)
23. ST80-X10 (Small Business Systems Group)
24. Telcom (Mumford Micro Systems)
25. Teleterm (Telexpress)
26. Uniterm & Uniterm/80 (B.T. Enterprises)
27. Videotex Communications Package (Radio Shack)
28. VIS/Bridge/DJ (Solutions)

I/III—Disk Operating Systems

1. DOSPLUS (Micro Systems)
2. Labimakr (ETS Center)
3. LCDOS (Sykam Systems Limited)
4. LDOS 5.1 (Logical Systems)
5. MULTIDOS (Cosmopolitan Electronics Corporation)

6. Nametagr (ETS Center)
7. NEWDOS/80 2.0 (Apperat)
8. TRSDOS (Radio Shack)
9. TSHARE Multi-User (ComSoft)
10. UCSD p-System (PCD Systems)
11. Z'DOS (Cosmopolitan Electronics Corporation)

I/III—Education

1. Better View A Zoo (Storybooks of the Future)
2. Book Conference (The Smallsystem Center)
3. CAIWARE-2D (Fireside Computing)
4. CAIWARE-3D (Fireside Computing)
5. Clear File (Teach Yourself by Computer Software)
6. Collectibles I (Basics and Beyond)
7. College Boards Prep Series (Krell Software Corp.)
8. Computer Discovery (Science Research Associates)
9. Computer Typing Course (Futureview)
10. Crossword Generator (Dynatek Information Systems)
11. Datagraph (Micro Software Systems)
12. Early Games for Young Children (Counterpoint Software)
13. Earth Science Series (Teach Yourself by Computer Software)
14. Electronic Breadboard (Instant Software)
15. Factor-Labal 1.1 (MMCC Educational Software)
16. Fast Basic Set (John Wiley & Sons)
17. Football Scout (Precision Prototypes)
18. Geography Explorer Series (Instant Software)
19. Grade Point Average (MMCC Educational Software)
20. Gradebook 2.2 (MMCC Educational Software)
21. Individual Study Center (Taach Yourself by Computer Software)
22. Jeopard! (MMCC Educational Software)
23. K-8 Math with Student Management (Radio Shack)
24. Language Teacher Series (Acorn Software Products)
25. Math Voyager (Instant Software)
26. Measurement Tables and Formulae (Dazoysa Enterprises)
27. Micro Discovery (Science Research Associates)
28. Microcosm I (Basics and Beyond)
29. Microcosm II (Basics and Beyond)
30. Microcosm III (Basics and Beyond)
31. Mighty Word Cannon (The Smallsystem Center)
32. Mind—Steps 1 & 2 (Teach Yourself by Computer Software)
33. Mostly Basic—Educational Package (Howard W. Sams & Co.)
34. Mostly Basic—Household Package (Howard W. Sams & Co.)
35. Mostly Basic—Scientific Package (Howard W. Sams & Co.)
36. Music Teacher (Instant Software)
37. NutriCalc (PCD Systems)
38. Random Access Vol. I Basic File Handling (D.S.C. Publishing)
39. Random Access Vol. II Advanced File Handling (D.S.C. Publishing)
40. Recipe (Software of the Future)
41. Remassern (Remsoft)
42. Scoreit (J. Eli and Associates)
43. Screen Author—Text Pacer (The Smallsystem Center)
44. Stinks Chess Tutor (William Fink)
45. Space Waste Race (Storybooks of the Future)
46. Spelling Primer (Synatek Information Systems)
47. SUPER-CAI (Fireside Computing)
48. T.E.S.T. (Teach Yourself by Computer Software)
49. Time Dungeon—American History (Howard W. Sams & Co.)
50. Time Dungeon—World History (Howard W. Sams & Co.)
51. Triangle Trig (Instant Software)
52. Typing Teacher (Instant Software)
53. Typing Tutor (Microsoft)
54. Vocabulary Builder (Dynatek Information Systems)
55. Words for the Wise (Teach Yourself by Computer Software)
56. Wordum (SoftCo)

I/III—Engineering

1. Active Filter Design (Howard W. Sams & Co.)
2. Auto-Loed for Finite Element Analysis (McClintock Corp.)
3. Commercial Cooling & Heating Load (McClintock Corp.)

4. Concrete Beam Design (McClintock Corp.)
5. Concrete Column Design (McClintock Corp.)
6. Critical Path Project Management (McClintock Corp.)
7. Descriptive Stats & Regression-Analysis (Howard W. Sams & Co.)
8. Duct Design (McClintock Corp.)
9. Elec Engineering Ladder Network-Analysis (Howard W. Sams & Co.)
10. Electronics 1 (Howard W. Sams & Co.)
11. Electronics 2 (Howard W. Sams & Co.)
12. Electronics 3 (Howard W. Sams & Co.)
13. Enhanced Finite Element Analysis (McClintock Corp.)
14. Fault Current Analysis (McClintock Corp.)
15. Finite Element Analysis (McClintock Corp.)
16. Fire Sprinkler Grid System (McClintock Corp.)
17. Fuse & Breaker Coordinator (McClintock Corp.)
18. Hardy Cross Water System Analysis (McClintock Corp.)
19. Heating Fuel Cost (McClintock Corp.)
20. HVAC Energy Consumption (McClintock Corp.)
21. HVAC Per 1981 (Coolidge & Associates)
22. Hydraulic Pipe Design (McClintock Corp.)
23. Life Cycle Cost (McClintock Corp.)
24. Lighting Calculations (Coolidge & Associates)
25. Lighting Design (McClintock Corp.)
26. One-Way, Two-Way Concrete Slab Design (McClintock Corp.)
27. Pipe Bending (McClintock Corp.)
28. Plotting Graphs for Line Printer (Howard W. Sams & Co.)
29. Plotting Graphs for Video Display (Howard W. Sams & Co.)
30. Residential Cooling & Heating Load (McClintock Corp.)
31. Shear Wall Design (McClintock Corp.)
32. Short Circuit Calculations (Coolidge & Associates)
33. Solar Collector F-Chart Calculation (McClintock Corp.)
34. Steel Beam Design (McClintock Corp.)
35. Steel Column Design (McClintock Corp.)
36. Surface Plot (Micro-Labs)

I/III—Games

1. Adventure (Adventure International)
2. Air Flight Simulator (Instant Software)
3. Alraaid (Small System Software)
4. Alien Defense (Soft Sector Marketing)
5. All Time Baseball (Krell Software Corp.)
6. Andromeda Conquest (Avalon Hill)
7. Apple Panic (Funsoft)
8. Armored Patrol (Adventure International)
9. Astrobell (Acorn Software Products)
10. Astrology (Radio Shack)
11. B-1 Nuclear Bomber (Avalon Hill)
12. Babie Terror (Funsoft)
13. Back 40 III (Adventure International)
14. Balrog (Adventure International)
15. Battle of ZEighty (JMG Software International)
16. Bedlam (Radio Shack)
17. Biorythme (KMCS/Phantasy)
18. Black Death (Krell Software Corp.)
19. Black Gold (Krell Software Corp.)
20. Black Hole, The (Funsoft)
21. Block-Breaker (Cedar Software Co.)
22. Bulls and Bears (Krell Software Corp.)
23. Casino Blackjack/Counter (Manhattan Software)
24. Casino Games I (Radio Shack)
25. Cassette Copy (B. Erickson Software)
26. Cassette Dump (B. Erickson Software)
27. Caterpillar (Soft Sector Marketing)
28. Chek-Ches/Shership-3 (B. Erickson Software)
29. Chess Board (Futureview)
30. Chicken (Soft Sector Marketing)
31. Clash (Computer Shack)
32. Close Assaault (Avalon Hill)
33. Commbet (Adventure International)
34. Computer Acquire (Avalon Hill)
35. Computer Baseball Strategy (Avalon Hill)
36. Computer Football Strategy (Avalon Hill)
37. Computer Foreign Exchange (Avalon Hill)
38. Computer Stats Pro Baseball (Avalon Hill)
39. Computer Stocks & Bonds (Avalon Hill)
40. Computer Title Bout (Avalon Hill)
41. Conflict 2500 (Avalon Hill)
42. Connectlos (Krell Software Corp.)
43. Conquest of Chesterwood (Adventure International)

44. Cosmic Patrol (Instant Software)
45. Craps/Slot Machine (B. Erickson Software)
46. Curse of Crowley Manor (Adventure International)
47. DC Ohms Law/FLC-FRC (B. Erickson Software)
48. Deadline (Infocom)
49. Death Planet: The Dogstar Adventure (Adventure International)
50. Demon Seed (Trend Software Company)
51. Demon Venture #1-Reign of the Red Dragon (Adventure International)
52. Dnlepar River Line (Avalon Hill)
53. Dragoolair (Futureview)
54. Draw Poker (Avalon Hill)
55. Duel on a Dead Planet (Futureview)
56. Duel-n-Droids (Acorn Software Products)
57. Earthquake—San Francisco 1906 (Adventure International)
58. Electoral College (Krell Software Corp.)
59. Eliminator (Adventure International)
60. Empire of the Overmind (Avalon Hill)
61. Enemy Evasion (Acorn Software Products)
62. Escape from Tream (Adventure International)
63. Everest Explorer (Acorn Software Products)
64. Exterminate (JMG Software International)
65. Flight Simulator (Sublogic Corporation)
66. Flying Saucers (Radio Shack)
67. Forest Fire Dispatcher (Sublogic Corporation)
68. Fortress II (Soft Sector Marketing)
69. Fredericksburg (Avalon Hill)
70. Galactic Series (Adventure International)
71. Galactic Tactics (Futureview)
72. Galaxy (Avalon Hill)
73. Gammon Gambler Backgammon (Radio Shack)
74. Gas Attack (Comp-U-Gamer Software)
75. GFS Sorceress (Avalon Hill)
76. Giant Space Slug (Futureview)
77. Gin Rummy 3.1 (Manhattan Software)
78. Gobbleman (Melbourne House Software)
79. Gone Fishing/Concentration (B. Erickson Software)
80. Grand Prix (Melbourne House Software)
81. Guns of Fort Defiance (Avalon Hill)
82. Halls of Time (Mops Computer Systems)
83. Haunted House (Radio Shack)
84. Hidden Valley (Adventure International)
85. Horse Race Handicapping System (3G Company)
86. IC-Timer-1/IC-Timer-2 (B. Erickson Software)
87. In-Between/Shell Game (B. Erickson Software)
88. Indoor Soccer (Pel-Tex)
89. Interactive Fiction (Adventure International)
90. Isaac Newton & F.G. Newton (Krell Software Corp.)
91. Jagdstaffel (Discovery Games)
92. Jet Fighter Pilot (Instant Software)
93. Kid-Venture (Adventure International)
94. Killapede (Futureview)
95. King of the Jungle (Acorn Software Products)
96. Kitchen Sink (Instant Software)
97. Laser Ball (Adventure International)
98. Laser Lights (Futureview)
99. Laaper (Cedar Software Co.)
100. Liberator (Computer Shack)
101. Light Cycle (Futureview)
102. Lords of Karne (Avalon Hill)
103. Lost Colony (Acorn Software Products)
104. Lunar Lander (Adventure International)
105. Maces & Magic Series (Adventure International)
106. Mad Mines (Funsoft)
107. Marooned Again (Futureview)
108. Martian Patrol (Melbourne House Software)
109. Master Reversal (Instant Software)
110. Meen Checkers (Adventure International)
111. Medieval Traveler (Futureview)
112. Microchees (Radio Shack)
113. Midway Campaign (Avalon Hill)
114. Migs & Messerschmitts (Discovery Games)
115. Million\$ (Vinzant & Associates Software Division)
116. Missile Attack (Adventure International)
117. Monty Plays Monopoly (Radio Shack)
118. Monty Plays Scrabble (Radio Shack)
119. Mortar Battle/Puzzle (B. Erickson Software)
120. Morton's Fork (Adventure International)
121. Nightwalker (Adventure International)
122. North Atlantic Convoy Raider (Avalon Hill)
123. Nuclear Beehive (Futureview)
124. Hukewar (Avalon Hill)
125. Number Guess/Dice Roll (B. Erickson Software)
126. Odyssey In Time (Krell Software Corp.)
127. Oscar Draft/Special Mission Pilot (BAPS Software)
128. Outhouse (Soft Sector Marketing)
129. P.T. Boat/Turtle Race (B. Erickson Software)
130. Paddle Pinball (Radio Shack)
131. Panzers East (Avalon Hill)
132. Penetrator (Melbourne House Software)
133. Phantasy Starlighter (KMCS/Phantasy)
134. Phase VII 3.0 (Futureview)
135. Pinball (Acorn Software Products)
136. Planet Buster (Soft Sector Marketing)
137. Planet Minars (Avalon Hill)
138. Planeteoids (Adventure International)
139. Plasmold Invasion (Comp-U-Gamer Software)
140. Primary Flight (Krell Software Corp.)
141. Pro-Cap (Trinity Group)
142. Pyramid (Radio Shack)
143. Pythagoras & Dragon (Krell Software Corp.)
144. Quode (Krell Software Corp.)
145. Raaka-Tu (Radio Shack)
146. RAF: The Battle of Britain (Discovery Games)
147. Rally (Soft Sector Marketing)
148. Peer Guard (Adventure International)
149. Regilian Worm (Prosoft)
150. ROM-Save (B. Erickson Software)
151. Rooma of Cygnes IV, The (Comp-U-Gamer Software)
152. Safari/Stership-2 (B. Erickson Software)
153. Santa Paravla and Fiumaccio (Instant Software)
154. Scarfman (Cornsoft Group)
155. Sea Dragon (Adventure International)
156. Slinks 3.0 Chess (William Flink)
157. Slinks 4.0 Chess (William Flink)
158. Shootout at the OK Galaxy (Avalon Hill)
159. Showdown (Adventure International)
160. Sim21 (BV Engineering)
161. Sky Sweep (Soft Sector Marketing)
162. Sneak Thief (Soft Sector Marketing)
163. Solitaire Computer Cards (Futureview)
164. Space Attack (Melbourne House Software)
165. Space Intruders (Adventure International)
166. Space Shuttle (Instant Software)
167. Space Warp (Radio Shack)
168. Sparrow Commander (Instant Software)
169. Spook House (Adventure International)
170. Star Clipper (Krell Software Corp.)
171. Starcross (Infocom)
172. StarFighter (Adventure International)
173. Starship/Sherlock Holmes (B. Erickson Software)
174. Stone of Slayphus (Adventure International)
175. Stratos (Adventure International)
176. Strike Force (Melbourne House Software)
177. Strip Concentration (Adventure International)
178. Strip Dice (Adventure International)
179. Super Sound (for Super Nova) (Comp-U-Gamer Software)
180. Super Star Baseball (Krell Software Corp.)
181. Super Vaders (Soft Sector Marketing)
182. Supreme Ruler (JMG Software International)
183. Suspended (Infocom)
184. Sword of Zedek (Krell Software Corp.)
185. Tank Arcade (Avalon Hill)
186. Tank Attack/Association (B. Erickson Software)
187. Tanktics (Avalon Hill)
188. Target Practice (Dezoysa Enterprises)
189. Teasers/Mouse (B. Erickson Software)
190. Telengard (Avalon Hill)
191. Think/Luck & Logic (B. Erickson Software)
192. Thor Reversi (William Flink)
193. Time Runner (Funsoft)
194. Time Traveler (Krell Software Corp.)
195. Toxic Dumpsite (Adventure International)
196. Treasure Island/Rescue (B. Erickson Software)
197. Treasure Quest (Adventure International)
198. VC (Avalon Hill)
199. Vexus (Soft Sector Marketing)
200. Voyage of the Valkyrie (Howard W. Sams & Co.)
201. Voyager (Avalon Hill)
202. Wild West (Melbourne House Software)
203. Winged Samurai (Discovery Games)
204. Wizard's City, The (BAPS Software)
205. Wordsum (SoftCo)
206. Wormhole (Futureview)
207. Xenos (Radio Shack)
208. Z-Chess (Adventure International)
209. Zork (Radio Shack)
210. Zork I (Infocom)

I/III—Graphics

1. Benner Machine (Virginia Micro Systems)
2. Crayon (Pioneer Software)
3. Crayon Deluxe (Pioneer Software)
4. Draw (Micro Labs)

"No, we're all okay, but our computer's gone."

It could have been a lot worse.

Luckily, all that was missing was the computer and some spreadsheet software. And that should be covered by insurance.

But it isn't. Ed didn't realize that once he started using his home computer on business projects, his homeowners insurance no longer would cover it.

As suddenly as the robbery had occurred, Ed found himself out several thousand dollars with no way to recover it.

You need SAFEWARE™

If you use your microcomputer for business, you can protect yourself from a loss like this with SAFEWARE. For as little as \$35 a year, SAFEWARE insurance covers all hardware, media and purchased software. Both business and personal.

SAFEWARE protects against theft, fire, accidental damage, even the destruction caused by power surges.

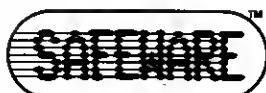
And, now, SAFEWARE is available on a 10-day trial basis. If you are not completely satisfied with the coverage provided, return the policy within 10 days for a full refund.

The only risk you take with SAFEWARE is not having it.

To obtain more information, or bind coverage immediately, call the toll free number. Or send the coupon to: Columbia National General Agency, 88 E. Broad St., Columbus, Ohio 43215 (In Ohio call toll free 1-800-848-2112).

1-800-848-3469

Hours: Mon.-Fri. 8:30-7;
Sat.-Sun. 10:30-4:30 (EST)



Amount of Insurance	Annual Premium
Up to \$ 2,000	\$.35
\$ 2,001-\$ 5,000	\$.60
\$ 5,001-\$ 8,000	\$.75
\$ 8,001-\$11,000	\$.90
\$11,001-\$14,000	\$105

Not avail. in AK, DC, HI, KY, LA, ME, MS,
NV, SC, or WY.

Send for immediate protection: CNGA, 88 E. Broad St., Columbus, Ohio 43215

Name _____

Street _____

City _____ State _____ ZIP _____

System value \$ _____

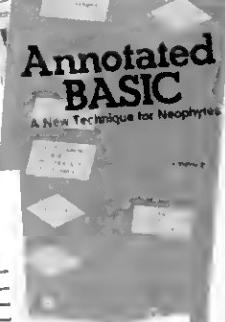
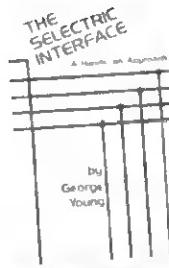
Check enclosed VISA MasterCard Card # _____

Expires: _____ Send additional information

✓ out our books for your TRS-80

THE REST OF 80

all
new
tutorials
and
utilities



TEXTEDIT
a complete
word processing
system in kit

INSIDE YOUR COMPUTER



WAYNE GREEN
CIRCUMFLEX

Call today!

1-800-343-0728
extension 191

WE BOOKS

5. Electric Window, The (Roklan Corporation)
6. Powerdot (Powersoft Products)
7. Powerdraw (Powersoft Products)
8. Scriptit (Pioneer Software)

I/III—Home/Personal Management

1. 97 Year Stock Market Average (Thomas V. Lenz)
2. Amateur Radio Theory Reviews (Micro-80)
3. Astro Star I (AGS Software)
4. Astro-Scope (AGS Software)
5. Billpayer (Stull Micro Products Corp.)
6. Black & Scholes Calculation (Roger S. Dildine)
7. Budget Management (Radio Shack)
8. Calendar Program (Dezoysa Enterprises)
9. Cassette Portfolio (Radio Shack)
10. Collectible I (Basics and Beyond)
11. Commodity Package (Thomas V. Lenz)
12. Cryptography (Roger S. Dildine)
13. Datagraph (Micro Software Systems)
14. Disk Trendex (Radio Shack)
15. Executive Scratch Pad (Software of the Future)
16. Expense Notebook (Software of the Future)
17. Family Tree (Computer Shack)
18. Generations, The Genealogy Program (Micro-80)
19. Ham Call Sign Search Program (Dezoysa Enterprises)
20. Home Budget (Howe Software)
21. Home Spreadsheet Templates (Software Models)
22. Index (Computer/Business Services)
23. Information Storage and Retrieval System (Dezoysa Enterprises)
24. Loan Calculator (Software of the Future)
25. Management System II (Micro-80)
26. Measurement Tables and Formulae (Dezoysa Enterprises)
27. Microcosm I (Basics and Beyond)
28. Microcosm II (Basics and Beyond)
29. Microcosm III (Basics and Beyond)
30. Money Manager (Acorn Software Products)
31. Nodvill Diet Program "Take a Byte" (Nodvill Software)
32. Paid (BV Engineering)
33. Pers-A-Mail (SoftCo)
34. Personal Check Manager (Adventure International)
35. Photo Assistant (Software of the Future)
36. Powermail (Powersoft Products)
37. Pro-Pix (Adventure International)
38. OSort (BV Engineering)
39. Reap (BV Engineering)
40. Record Library (Software of the Future)
41. Seven Program Package (BAPS Software)
42. Sex-O-Scope (AGS Software)
43. Sign (Precision Prototypes)
44. SMAS (Spiral Enterprises)
45. Stockpak (Radio Shack)
46. Super Calendar (Precision Prototypes)
47. Super-Log II (Micro-80)
48. Supertax (Rockware Data Corporation)
49. Tallymaster (Prosoft)
50. Tax Planner (Computer Systems and Services)
51. Transit Star (AGS Software)
52. Trendex Stock Trend Analysis (Radio Shack)
53. Video Library (Software of the Future)
54. Your Family Tree (Acorn Software Products)

I/III—Music

1. Fanfare (Software Affair)
2. Greatest Hits (Software Affair)
3. Music "Magic" (Pioneer Software)
4. Orchestra-85 (Software Affair)
5. Orchestra-80 (Software Affair)
6. Piano-85/90 (Software Affair)

I/III—Spelling Checkers

1. Chextext (Apparatus)
2. Electric Webster (Cornucopia Software)
3. Grammatik (Aspen Software)
4. Hexspell (Hexagon Systems)
5. Microproof (Cornucopia Software)
6. Random House Proofreader (Aspen Software)
7. Scripsit Dictionary (Radio Shack)

I/III—Utilities

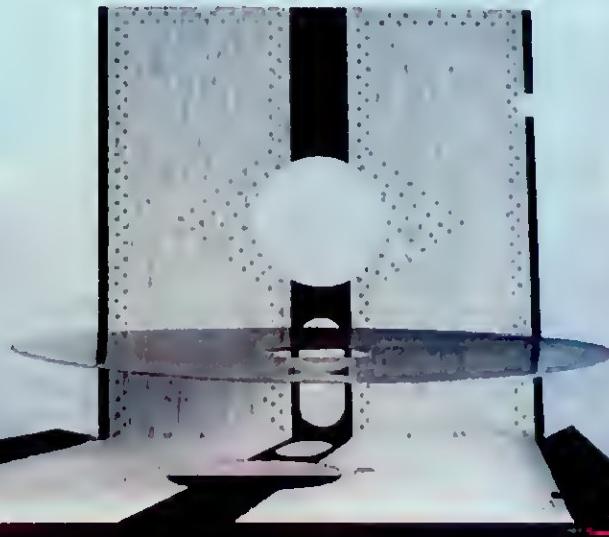
1. Accel 384 (Allen Gelder Software)
2. ADS Utilities #1 (Howard W. Sams & Co.)
3. Arranger (Triple-D Software)
4. Aseem/Zsim (Instant Software)
5. ASMB-18 (Allen Ashley)
6. ASMB-20 (Allen Ashley)
7. ASMB-38 (Allen Ashley)
8. ASMB-48 (Allen Ashley)
9. ASMB-51 (Allen Ashley)
10. ASMB-Z8 (Allen Ashley)
11. Basic Answer, The (Logical Systems)
12. Basic Compiler (PCD Systems)
13. Boss (Cosmopolitan Electronics Corporation)
14. BOSS/Renum 90 (Cosmopolitan Electronics Corporation)
15. CASM Editor/Assembler (Crown Micro Products)
16. Casop (B.T. Enterprises)
17. CO-DIR Cursor Oriented Directory (Picotrin Technology)
18. Commnir (Sykam Systems Limited)
19. Complete Memory Dump (Roger S. Dildine)
20. Comret (Apparatus)
21. Copy III (B.T. Enterprises)
22. Count, The (Sturdivant and Dunn)
23. DCV-1 Tape to Disk (Small System Software)
24. Debug (Radio Shack)
25. Disk Index (Mumford Micro Systems)
26. DISKLIB (Sykam Systems Limited)
27. DISnDATa Disassembler (ProAm Software)
28. DLDIS (Instant Software)
29. DosAsdis (Philadelphia Consulting Group)
30. DSMLBL II (MISOSYS)
31. EDAS (MISOSYS)
32. Edit (Allen Gelder Software)
33. Edit (Full Screen Editor) (D.C.S. Software)
34. Editor/Assembler (Series I) (Radio Shack)
35. EDTASM (Radio Shack)
36. Enigma—An Unbreakable File (Casler Computing)
37. Epson Driver Program (Apparatus)
38. Fast Sort (Precision Prototypes)
39. Faster (Prosoft)
40. FED (Logical Systems)
41. File Transfer Program (Personal Computer Products)
42. Filter Package #1 (Logical Systems)
43. Filter Package #2 (Logical Systems)
44. FLEXTEXT Plus (Apparatus)
45. Fortran Compiler (PCD Systems)
46. Fourier Analysis (Roger S. Dildine)
47. Full Screen Text Editor for Basic, The (Computer Applications Unlimited)
48. Hex Man (Hexagon Systems)
49. I/O Monitor (Logical Systems)
50. Instant Assembler (Mumford Micro Systems)
51. Interactive Control Language (XYZ Computer Dimensions)
52. Invn (Inventory Management) (D.C.S. Software)
53. LC (MISOSYS)
54. LDOS Help Command (Vinzent & Associates Software Division)
55. LED (Logical Systems)
56. Lisp Interpreter (PCD Systems)
57. Loadhex Disk File Transfer (Crown Micro Products)
58. Macro-Monitor (Howard W. Sams & Co.)
59. Manipulator, The (Vinzent & Associates Software Division)
60. Mastery Directory (Howard W. Sams & Co.)
61. Maxi Stat (Adventure International)
62. Maxprint (Peggytronics)
63. Maxprint Plus (Peggytronics)
64. MCopy (Stewart Software)
65. MDIS (Sykam Systems Limited)
66. Meta (Far West Systems & Software)
67. Monitor #3 (Howe Software)
68. Monitor #4 (Howe Software)
69. Monitor #5 (Howe Software)
70. M-Zal (Computer Applications Unlimited)
71. NEWBASIC 2.0 (Modular Software Associates)
72. Pascal Compiler (PCD Systems)
73. Pascal-80 (New Classics Software)
74. PDS (MISOSYS)
75. PDS (Allen Ashley)
76. Powerdot (Powersoft Products)
77. Powerdraw (Powersoft Products)
78. Ram-Sledges (XYZ Computer Dimensions)
79. RPM (Prosoft)
80. RSM-1P (EPROM) (Small System Software)
81. RSM3 (Small System Software)

BASF QUALIMETRIC™ FLEXYDISKS® BUILT FOR ETERNITY - WARRANTED FOR A LIFETIME.

BASF Qualimetric FlexyDisks® offer you more...an extraordinary new lifetime warranty. The BASF Qualimetric standard is a dramatic new international standard of quality in magnetic media...insurance that your most vital information will be secure for tomorrow when you enter it on BASF FlexyDisks today.*

We can offer this warranty with complete confidence because the Qualimetric standard reflects a continuing BASF commitment to perfection...a process which begins with materials selection and inspection, and continues through coating, polishing, lubricating, testing, and 100% error-free certification. Built into our FlexyDisk jacket is a unique two-piece liner. This BASF feature traps damaging debris away from the media surface, and creates extra space in the head access area, insuring optimum media-to-head alignment. The result is a lifetime of outstanding performance.

When your information must be secure for the future, look for the distinctive BASF package with the Qualimetric seal. Call 800-343-4600 for the name of your nearest supplier.



ENTER TOMORROW ON BASF TODAY

*Under certain conditions. See warranty booklet for details. © 1987 BASF Systems Group, a division of BASF AG, Ludwigshafen (Rhine), FRG.



BASF

82. Screen Artist II (The Smellaystem Center)
83. Serial Printer Driver (Alps)
84. SOLE (MISOSYS)
85. Sort-80 (Small Business Systems Group)
86. Step80 (Mumford Micro Systems)
87. Stretch SuperStep (Allen Geller Software)
88. Subpacker (The Smellaystem Center)
89. Super Directory (Computer Shack)
90. Super DOS (Computer Shack)
91. Super Duper (WittSoft)
92. Super Utility Plus (Powersoft Products)
93. Super-Dir 1.3 (SMS Products)
94. Superkeys (Howard W. Sams & Co.)
95. System Diagnostic (Howe Software)
96. System Savers (Acorn Software Products)
87. Tape Copy 2 (Soft Sector Marketing)
89. tiny-c ONE (Inyc-c Associates)
99. TLDIS (Instant Software)
100. Toolbox for LDOS, Th (Powersoft Products)
101. Transporter (Bodnar Associates)
102. Trashman (Prosoft)
103. TRSDUM 1&3 (CRB Microtools)

104. TRSTUM 1&3 (CRB Microtools)
105. TSHARE Multi-User (ComSoft)
106. Ultra mon (Instant Software)
107. UOLISP (Far West Systems & Software)
108. UTIL-Cassette Operating System (J.P.C. Products Co.)
109. Utility Disk #1 (Logical Systems)
110. Utility Pack (B.T. Enterprises)
111. VIS/Bridge/GL (Solutions)
112. VIS/Bridge/Report (Solutions)
113. VIS/Bridge/Sort (Solutions)
114. WOBDS I (Western Operations)
115. XBug (Computer Applications Unlimited)
118. Zapsit Disk (Soft Sector Marketing)
117. ZBasic 2.2 (Simutek Computer Products)
118. Zsim (Instant Software)

I/III—Word Processors

1. Cleen Slate (Howard W. Sams & Co.)
2. CopyArt II (Simutek Computer Products)
3. Crayon (Pioneer Software)

4. Crayon Deluxe (Pioneer Software)
5. Docu-Writer Word Processor (Nepenthe Programs)
6. Electric Pencil (Michael Shrayer)
7. Electric Pencil (McClintock Corp.)
8. Formlet (Contract Services Associates)
9. Formlet for Churches (Custom Data)
10. Lazy Writer (Soft Sector)
11. Letter-Writer (Astro-Star Enterprises)
12. Letter/Report Writer Program (Dezoysa Enterprises)
13. Micro-Script Word Processor (Micro-80)
14. Micro-Typit (Coolidge & Associates)
15. Newsprint (Prosoft)
18. Pei-Tek Word Machine (Pei-Tek)
17. Powerdriver for Superscript (Powersoft Products)
18. Scriptplus (Powersoft Products)
19. Scriptit (Radio Shack)
20. Scriptr (Pioneer Software)
21. SuperScript Printer Drivers (Alps)
22. SuperScript (Acorn Software Products)
23. Typ/Pri (Contract Services Associates)
24. Typitell (Howe Software)
25. XTRA Special Delivery (Software Concepts)

Model II/12/16 Software

II/12/16—Accounting

1. Accounting Program (McClintock Corp.)
2. Accounting Software (Compumex Associates)
3. Accounts Payable (Radio Shack)
4. Accounts Payable (Taranto & Associates)
5. Accounts Receivable (Radio Shack)
8. Accounts Receivable (Taranto & Associates)
7. Accounts Receivable Balance Forward (Taranto & Associates)
- B. ACCT (Micro Architect)
9. Amortization (Rockware Data Corporation)
10. Aseet (PCD Systems)
11. CBook (Contract Services Associates)
12. Corporate 1120 (CPAids)
13. Data Train's "The Accountant" (Thoughtware Publishing Company)
14. General Ledger (Taranto & Associates)
15. General Ledger II (CPAids)
18. Integrated Accounting Package (Micro Architect)
17. Inventory (McClintock Corp.)
18. Inventory Control (Taranto & Associates)
19. Job Cost Control (McClintock Corp.)
20. Master Tax Program (CPAids)
21. Payroll (Radio Shack)
22. Payroll (McClintock Corp.)
23. Payroll (Taranto & Associates)
24. Quick Check (Chuck Atkinson Programs)
25. SBSG Accounts Payable (Small Business Systems Group)
26. SBSG Accounts Receivable (Small Business Systems Group)
27. SBSG General Ledger (Small Business Systems Group)
28. SBSG Inventory (Small Business Systems Group)
29. SBSG Invoicing/Order Entry (Small Business Systems Group)
30. SBSG Payroll (Small Business Systems Group)
31. Small Business Accounting (Howe Software)
32. Supertax (Rockware Data Corporation)
33. Tax Planner (CPAids)
34. Taxpian (Contract Services Associates)
35. Taxpro (Contract Services Associates)
36. Time Accounting (Radio Shack)
37. Visi-Print (The Proper Touch)
38. Viz-A-Con (Abacus Associates)

12. Country Club Management (The Software Terminal)
13. Dental Office System (Windham Software)
14. Directory for Churches (Custom Data)
15. Econometrics (Century Software Systems)
18. Electronic Broker (Radio Shack)
17. Finance Spreadsheet Templates (Software Models)
18. Financial Decisions (Century Software Systems)
19. Financial Planning with VisiCalc (Howard W. Sams & Co.)
20. Financial Statement Analysis (Century Software Systems)
21. General Ledger (Radio Shack)
22. Heating Fuel Cost (McClintock Corp.)
23. HELU Accounting (PCD Systems)
24. HELU Property Management (PCD Systems)
25. Instant Mathematical Programming (PCD Systems)
26. Insure (The Software Terminal)
27. Inventory Control System (Radio Shack)
28. Inventory Management System (Radio Shack)
29. Investor III (Good Software Corp.)
30. Job Costing (ELTECH Associates)
31. Job Costing (Radio Shack)
32. Labor Collection/Performance (ELTECH Associates)
33. Lease Versus Purchase Analysis (Century Software Systems)
34. Life Cycle Cost (McClintock Corp.)
35. Linear Programming (Century Software Systems)
36. Litigation Support (Radio Shack)
37. Loencomp (Contract Services Associates)
36. Mail (Micro Architect)
39. Mail/File Series II (Logical Systems)
40. Mailer (PCD Systems)
41. Mailing List (Howe Software)
42. Mailing List II (Radio Shack)
43. Manufacturing Inventory System (Radio Shack)
44. Medical Office System (Windham Software)
45. Medical Office System (Radio Shack)
46. Medoffice (PCD Systems)
47. Manufacturing Inventory Control (ELTECH Associates)
48. NutriCalc (PCD Systems)
49. Order Entry (American Small Business Computers)
50. Order Entry/ICS (Radio Shack)
51. Order Entry with Inventory Control (Radio Shack)
52. Patient Data Management (The Software Terminal)
53. Pension Maker Defined Benefit System (Emmanuel B. Garcia, Jr. & Associates)
54. Pension Maker Defined Contribution System (Emmanuel B. Garcia, Jr. & Associates)
55. Pers-A-Mail (SoftCo)
56. Personal Datebook (PCD Systems)
57. Personnel Search (Radio Shack)
58. Point of Sale Inventory (SoftCo)
59. Powermail (Powersoft Products)
60. Premium Finance Insurance (Program Innovations)
81. Professional Time Accounting (Computer Systems and Services)
82. Property Management (The Software Terminal)
83. Purchasing Control (ELTECH Associates)
84. Quick Register (Chuck Atkinson Programs)
85. Real Estate Analysis (Century Software Systems)

86. Real Estate Spreadsheet Templates (Software Models)

87. Sales Analysis (Radio Shack)
88. Series Print (Computer/Business Services)
86. Shop Order Control (ELTECH Associates)
70. Small Business Management (Howe Software)
71. Statistical Analysis (Radio Shack)
72. Statistician, The (Quanl Systems)
73. Statistics (Century Software Systems)
74. Supermail (American Small Business Computers)
75. Tickertec (Max Ute & Company)
78. TRS-80 Meems Business Set (John Wiley & Sons)
77. Vending (The Software Terminal)
78. VisiCalc (VisiCorp)

II/12/16—Data-Base Management

1. AIDS-III (Meta Tech.)
2. CCDS—Relational Database Management System (Data Management Systems)
3. Database Management (Institute for Scientific Analysis)
4. IDM (Micro Architect)
5. In-Memory Database Management (Howe Software)
8. LogiCalc (PCD Systems)
7. Logiques (PCD Systems)
8. MDBS III (International Software Enterprises)
8. PD Base (PCD Systems)
10. Profile of Church Members (Custom Data)
11. Profile II (Radio Shack)
12. Q-Pro 4 (Dulc-N-Eael Products)

II/12/16—Data Communications

1. Binary Synchronous Communications (Radio Shack)
2. Lync (International Software Allience)
3. Dmnlterm (Lindbergh Systems)
4. Smart Terminal (Howe Software)
5. ST80-III (Small Business Systems Group)
8. Teleterm (Telexpress)
7. Videotex (Radio Shack)
8. Vie/Bridge/DJ (Solutions)

II/12/16—Disk Operating Systems

1. ATOM CP/M 2.2 Floppy (ATOM International)
2. ATDN CP/M 2.2 R.S. 8/12 Meg HD (ATDN International)
3. CP/M (Digital Research)
4. DOSPLUS II (Powersoft Products)
5. TRSDDDS (Radio Shack)
6. UCSD p-System (PCD Systems)

II/12/16—Education

1. Instant Mathematical Programming (PCD Systems)

2. MicroTyping (Hayden)
3. NutriCalc (PCD Systems)
4. Random Access Vol. I Basic File Handling (D.S.C. Publishing)
5. Random Access Vol. II Advanced File Handling (D.S.C. Publishing)

II/12/16—Engineering

1. Auto-Load for Finite Element Analysis (McClintock Corp.)
2. Commercial Cooling & Heating Load (McClintock Corp.)
3. Concrete Beam Design (McClintock Corp.)
4. Concrete Column Design (McClintock Corp.)
5. Critical Path Project Management (McClintock Corp.)
6. Duct Design (McClintock Corp.)
7. Enhanced Finite Element Analysis (McClintock Corp.)
8. Fault Current Analysis (McClintock Corp.)
9. Finite Element Analysis (McClintock Corp.)
10. Fire Sprinkler Grid System (McClintock Corp.)
11. Fuse & Breaker Coordinator (McClintock Corp.)
12. Hardy Cross Water System Analysis (McClintock Corp.)
13. Heating Fuel Cost (McClintock Corp.)
14. HVAC Energy Consumption (McClintock Corp.)
15. Hydraulic Pipe Design (McClintock Corp.)
16. Life Cycle Cost (McClintock Corp.)
17. Lighting Design (McClintock Corp.)
18. One-Way, Two-Way Concrete Slab Design (McClintock Corp.)
19. Pipe Bending (McClintock Corp.)
20. Residential Cooling & Heating Load (McClintock Corp.)
21. Shear Wall Design (McClintock Corp.)
22. Solar Collector F-Chart Calculation (McClintock Corp.)
23. Steel Beam Design (McClintock Corp.)
24. Steel Column Design (McClintock Corp.)

II/12/16—Games

1. Adventure (Adventure International)
2. Chess (Kuzel Computer Services)
3. Galactic Invaders (Kuzel Computer Services)
4. Interactive Fiction (Adventure International)
5. Maryland Model II Game (two/sixteen magazine)

8. Munchman (Kuzel Computer Services)
7. Othello (Kuzel Computer Services)
8. Quest for Adventure (Kuzel Computer Services)
9. Sargon II (Hayden)
10. Starship/I (two/sixteen magazine)
11. Wormy (Kuzel Computer Services)

II/12/16—Home/Personal Management

1. Astro Star I (AGS Software)
2. Astro-Scope (AGS Software)
3. Home Budget (Howe Software)
4. Home Spreadsheet Templates (Software Models)
5. Mailer (PCD Systems)
6. Personal Datebook (PCD Systems)
7. Powermail (Powersoft Products)
8. Sector (Sykem Systems Limited)
9. Sex-O-Scope (AGS Software)
10. Superprogram II (AGS Software)
11. Supertax (Rockware Data Corporation)
12. Transit Star (AGS Software)

II/12/16—Spelling Checkers

1. Grammatik (Aspen Software)
2. Scripsit Dictionary (Radio Shack)

II/12/16—Utilities

1. 3D Plotter (Maxtek)
2. BACKPACK (Format/Backup/Reorganize) (Skyline Software)
3. Basic Compiler (PCD Systems)
4. Basic Cross Reference (Good-Lyndon Data Systems)
5. Basic Surrogate (ATON International)
6. CP/M to p-System (PCD Systems)
7. Development Package (Racet Computers)
8. Development Utilities (Allen Ashley)
9. Disassembler (Program Innovations)
10. Disassembler/Memory Map (Skyline Software)
11. Disk Sort (Good-Lyndon Data Systems)
12. Editor/Assembler (Radio Shack)
13. Extended Built In Functions (Snappware)
14. File Transfer Program (Personal Computer Products)
15. Fortran Compiler (PCD Systems)
16. Fortran Extension Library (The Proper Touch)

17. Graph Plotter (Maxtek)
18. Graphics Terminal (Maxtek)
19. IBM 2741 to p-System (PCD Systems)
20. KEYEDIT (Basic Keyboard Handler) (Skyline Software)
21. Lisp Interpreter (PCD Systems)
22. Menu Generator (Radio Shack)
23. OmniWriter Video Text Editor (ATDN International)
24. Pascal Compiler (PCD Systems)
25. Profile Archive (Radio Shack)
26. Program Editor (Radio Shack)
27. Reformatter (Radio Shack)
28. RSMII (Smell System Software)
29. Screen Printer (Maxtek)
30. Surface Plotter (Maxtek)
31. Symbol Generator (Maxtek)
32. System-18 (Allen Ashley)
33. System-20 (Allen Ashley)
34. System-320 (Allen Ashley)
35. System-3870 (Allen Ashley)
36. System-48 (Allen Ashley)
37. System-51 (Allen Ashley)
38. System-70 (Allen Ashley)
39. System-75 (Allen Ashley)
40. System-99 (Allen Ashley)
41. System-CP4 (Allen Ashley)
42. System-TMS7 (Allen Ashley)
43. System-Z8 (Allen Ashley)
44. Versatile (Radio Shack)
45. VIS/Bridge/GL (Solutions)
46. VIS/Bridge/Report (Solutions)
47. VIS/Bridge/Sort (Solutions)
48. VisCair Surrogate (ATON International)
49. XRMak-18 (Allen Ashley)
50. XRMak-F8 (Allen Ashley)
51. XRMak-ZB (Allen Ashley)
52. Z-CDM (Allen Ashley)

II/12/16—Word Processors

1. Electric Pencil (Michael Shreyer)
2. Electric Pencil (McClintock Corp.)
3. Formlet (Contract Services Associates)
4. Formlet for Churches (Custom Data)
5. KWIX (Key Word Index for Scripsit (Skyline Software))
6. Scripsit 2.0 (Radio Shack)
7. Typ/Prt (Contract Services Associates)
8. WordStar (Micro Pro)

Color Computer Software

CoCo—Accounting

1. Accounts Payable (Universal Data Research)
2. Accounts Receivable (Universal Data Research)
3. Balanced Billing (Universal Data Research)
4. Church Contributions (Universal Data Research)
5. General Ledger (Universal Data Research)
6. Inventory II (Universal Data Research)
7. Non-Disk Check System (Futureview)
8. Non-Disk Electric Bookkeeper (Futureview)
9. Payroll (Universal Data Research)
10. Single Entry General Ledger (Universal Data Research)

CoCo—Business

1. Accounts Receivable (Brantex)
2. Data Plotting Software (Kern Publications)
3. General Ledger (Brantex)
4. Graphic Software (Kern Publications)
5. Non-Disk Check System (Futureview)
6. Non-Disk Electric Bookkeeper (Futureview)
7. Non-Disk Sales/Inventory (Futureview)
8. Personal Finance (Radio Shack)
9. Small Business Accounting (Brantex)
10. Spectacular (Radio Shack)
11. Stock Portfolio Management (Superior Graphics Software)

CoCo—Data-Base Management

1. C.C. File (Trans Tek)

2. C.C. Mailer (Trans Tek)
3. Data Base Manager (Universal Data Research)
4. Data Plotting Software (Kern Publications)
5. TIMS (Sugar Software)

CoCo—Data Communications

1. COLORCOM/E (Eigen Systems)
2. Microtext (The Micro Works)
3. Remoterm (Star-Kits)
4. Super Color Terminal (Nelson Software)

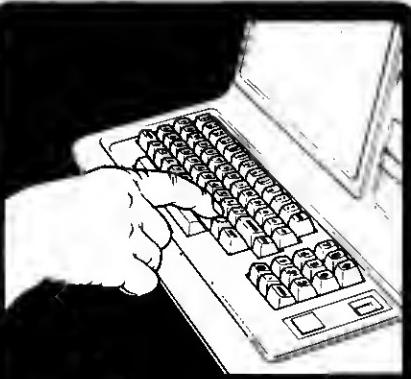
CoCo—Disk Operating Systems

1. FLEX/FMate (RS) (Data-Comp)
2. Forth (Forthright Software)
3. Star-DOS (Star-Kits)
4. TRSDOS (Radio Shack)

CoCo—Education

1. Advanced Graphics (Radio Shack)
2. Alpha Key (Radio Shack)
3. Author I (Radio Shack)
4. Beatles, The (Radio Shack)
5. Bingo Math (Radio Shack)
6. C.A.R.D. I (Radio Shack)
7. Change (Brantex)
8. Charles Lindbergh/Amelia Earhart (Radio Shack)
9. Color LOGO (Radio Shack)

10. Computer Discovery for Junior High (Radio Shack)
11. Computer Discovery for Senior High (Radio Shack)
12. Date Plotting Software (Kern Publications)
13. Dracula (Radio Shack)
14. Early Games for Young Children (Counterpoint Software)
15. Electric Typing Teacher (Soft Sector Marketing)
16. Flashcards (Forthright Software)
17. Galactic Hangman (Sugar Software)
18. Geography Pack (Radio Shack)
19. Graphical Analysis of Experimental Data (Radio Shack)
20. Graphic Software (Kern Publications)
21. History of American Learning Unit (Radio Shack)
22. Hound of the Baskervilles, The (Radio Shack)
23. Interpreting Graphs in Physics (Radio Shack)
24. Inventions That Change Our Lives (Radio Shack)
25. Matrices, Determinants, and Simultaneous Equations (Radio Shack)
26. Micro PILOT (Radio Shack)
27. Moby Dick (Radio Shack)
28. Number Theory (Radio Shack)
29. Numeric Data Entry Practice (Radio Shack)
30. Pioneers In Technology (Radio Shack)
31. Plane Analytic Geometry (Radio Shack)
32. Quadratic Equations (Radio Shack)
33. Quick Quiz (Radio Shack)
34. Silly Syntex (Sugar Software)
35. 20,000 Leagues Under the Sea (Radio Shack)
36. Typing Teacher (Instant Software)
37. Typing Tutor (Radio Shack)
38. Vector Addition (Radio Shack)
39. Vocabulary Tutor 1 (Radio Shack)
40. Vocabulary Tutor 2 (Radio Shack)



**NOW
ONE FINGER TYPING
IS FAST
WITH SUPA-EDIT**



SUPA★EDIT™

Supa-Edit is a powerful machine language utility, designed to enhance LIST/EDIT commands of Level II Basic.

Supa-Edit uses less than 0.5K of computer memory and suits Model I and Model III.

Supa-Edit comes with and without lower-case driver for 16K, 32K and 48K systems, on premium tape.

SUPA-EDIT SINGLE KEY FEATURES

- LIST FIRST LINE
- LIST LAST LINE
- ENTER EDIT MODE
- LIST LINE BY LINE
- BACK AND FORTH
- RECOVER AFTER NEW

SEND PAYMENT
U.S. CURRENCY

U.S. \$10 plus U.S. \$3 FOR
RETURN AIRMAIL DELIVERY

Elite Electronic Industries

36 LUXMOORE STREET,
CHELTENHAM, VIC. 3192
AUSTRALIA ✓125
TELEPHONE +61-3-583 1201

Master I & II products of Randy Corp

CoCo—Games

1. Air Flight Simulator (Instant Software)
2. Alchemist's Laboratory, The (Real Software Company)
3. Animated Hangman (Soft Sector Marketing)
4. Astro Blast (Mark Data Products)
5. Bedlam (Radio Shack)
6. Bingo Math (Radio Shack)
7. Black Sanctum (Mark Data Products)
8. Breakthru (Avalon Hill)
9. Brickaway (Britt Monk, CDP)
10. Calixto Island (Mark Data Products)
11. Canyon Climber (Radio Shack)
12. Card Games (Radio Shack)
13. Cassette Copy (B. Erickson Software)
14. Cassette Dump (B. Erickson Software)
15. Castle Guard (Radio Shack)
16. Cave Hunter (Mark Data Products)
17. Chek-Ches/Starship-3 (B. Erickson Software)
18. Chess (Radio Shack)
19. Chess (Flex) (Data-Comp)
20. Clowns and Balloons (Radio Shack)
21. Color Backgammon (Radio Shack)
22. Color Berserk (Mark Data Products)
23. Color Bonanza (Soft Sector Marketing)
24. Color Caterpillar (Soft Sector Marketing)
25. Color Craps (Adventure International)
26. Color Cubes (Radio Shack)
27. Color Pac Attack (The Micro Works)
28. Color Robot Battle (Radio Shack)
29. Concentration/Connect (Soft Sector Marketing)
30. Cosmic Dogfight (American Small Business Computers)
31. Craps/Slot Machine (B. Erickson Software)
32. Crosswords (Radio Shack)
33. DC Ohms Law/FLC-FRC (B. Erickson Software)
34. Death Planet: The Dogstar Adventure (Adventure International)
35. Death Trap (Soft Sector Marketing)
36. Dine Wars (Radio Shack)
37. Double Back (Radio Shack)
38. Escape (Brantex)
39. Galactic Attack (Radio Shack)
40. Galactic Hangman (Sugar Software)
41. Gauntlet (Avalon Hill)
42. Gin Champion (Radio Shack)
43. Glaxxons (Mark Data Products)
44. Gone Fishing/Concentration (B. Erickson Software)
45. Graphics Pack (Radio Shack)
46. Haywire (Mark Data Products)
47. Horse Race Handicapping System (3G Company)
48. Hurdlers Tape (Soft Sector Marketing)
49. IC-Timer-1/IC-Timer-2 (B. Erickson Software)
50. In-Between/Shell Game (B. Erickson Software)
51. Kid Stuff I (Forthright Software)
52. Lokar's Magic Staff (Real Software Company)
53. Madness and the Minotaur (Radio Shack)
54. Mega-Bug (Radio Shack)
55. MegaMaze (Real Software Company)
56. Microbes (Radio Shack)
57. Micro Painter (Radio Shack)
58. Monster Maze (Radio Shack)
59. Moon Shuttle (Datasoft)
60. Moonlander (American Small Business Computers)
61. Mortar Battle/Puzzle (B. Erickson Software)
62. Name That Tune (Forthright Software)
63. Night Tower Descent (Real Software Company)
64. Number Guess/Dice Roll (B. Erickson Software)
65. Offender (American Small Business Computers)
66. P.T. Boat/Turtle Race (B. Erickson Software)
67. Packet Man (American Small Business Computers)
68. Phase VII 3.0 (Futureview)
69. Polaris (Radio Shack)
70. Poltergeist (Radio Shack)
71. Popcorn (Radio Shack)
72. Project Nebula (Radio Shack)
73. Pyramid (Radio Shack)
74. Raaka-Tu (Radio Shack)
75. Roman Checkers (Radio Shack)
76. ROM-Save (B. Erickson Software)
77. Safari/Starship-2 (B. Erickson Software)
78. Sands of Egypt (Radio Shack)
79. Santa Paravia and Fiumaccio (Instant Software)
80. Shooting Gallery (Radio Shack)
81. Shootout at the OK Galaxy (Avalon Hill)
82. Silly Syntax (Sugar Software)
83. Skating (Radio Shack)
84. Space Assault (Radio Shack)
85. Space Raiders (Mark Data Products)
86. Squeeze (Real Software Company)
87. Star Blaster (The Micro Works)
88. Starship/Sherlock Holmes (B. Erickson Software)
89. Strip Concentration (Adventure International)
90. Strip Dice (Adventure International)
91. Strip Tease (Britt Monk, CDP)
92. Super Bustout (Radio Shack)
93. Tank Attack/Association (B. Erickson Software)
94. Teasers/Mouse (B. Erickson Software)
95. Tennis (Radio Shack)
96. Think/Luck & Logic (B. Erickson Software)
97. Three-D Tic-Tac-Toe (Adventure International)
98. Treasure Island/Rescue (B. Erickson Software)
99. VC (Avalon Hill)
100. Voyager (Avalon Hill)
101. Wildcattin (Radio Shack)
102. Zaxxon (Datasoft)

CoCo—Graphics

1. Art Gallery (Radio Shack)
2. Color Show Displays (Real Software Company)
3. Images I (Radio Shack)
4. Images II (Radio Shack)
5. MPP Graphics (Superior Graphics Software)

CoCo—Home/Personal Management

1. Audio Spectrum Analysis (Radio Shack)
2. Bridge Tutor (Radio Shack)
3. C.C. Calc (Trans Tek)
4. Champs (Radio Shack)
5. Check 'N Tax (Star-Kits)
6. Color Accountant, The (Programmer's Institute)
7. Color File (Radio Shack)
8. Data Plotting Software (Kern Publications)
9. Diet-Trac (Flex) (Data-Comp)
10. Graphic Software (Kern Publications)
11. Handymen (Radio Shack)
12. Personfile (Radio Shack)
13. Personal Finance (Radio Shack)
14. REKDRD Planner (Radio Shack)
15. Stock Analyzer (Brantex)
16. Tax Handler, The (Programmer's Institute)

CoCo—Spelling Checkers

1. Spell 'N Fix (Star-Kits)
2. Spell-Hite (Eigen Systems)

CoCo—Utilities

1. 80C Disassembler (The Micro Works)
2. AutoRun (Sugar Software)
3. Basic Aid (Eigen Systems)
4. CBUG Monitor (The Micro Works)
5. CCEAD (Eigen Systems)
6. Color Graphic Editor (Soft Sector Marketing)
7. ColorZAP (Software Options)
8. CPrint (Micro-Labs)
9. Diagnostic ROM (Radio Shack)
10. Disassembler 6809 (Soft Sector Marketing)
11. Editor/Assembler (The Micro Works)
12. EDTASM + (Radio Shack)
13. Graphics Character Set (Forthright Software)
14. Graphics Screen Editor (Real Software Company)
15. Humbug (Star-Kits)
16. JBUG Monitor Program (J.P.C. Products Co.)
17. MACRO-80C Editor/Assembler Monitor (The Micro Works)
18. Master Control II (Soft Sector Marketing)
19. Monitor (Forthright Software)
20. Newtalk (Star-Kits)
21. Okl-Print (Soft Sector Marketing)
22. SDS80C Editor/Assembler/Monitor (The Micro Works)
23. Sigmom (Data Soft)
24. Stripper (Eigen Systems)
25. Tape Dir (Soft Sector Marketing)
26. Term (Flex) (Data-Comp)
27. WCBOS I (Western Operations)

CoCo—Word Processors

1. C.C. Writer (Trans Tek)
2. Color Script (Radio Shack)
3. Super Color Writer II (Nelson Software)
4. Telewriter-64 (Cognitec)

Expensive Expansion



EXPENSIVE – The LNW System Expansion II and built-in comes with a full 32K of 200ns RAM RS232c 20 MA current loop serial interface. That's for starters. Next, consider our heavy gauge steel case, power indicator lamp, gold-plated connectors, FR-2 glass epoxy circuit board with solder mask and silk screen legends. Then there is the parallel printer port, screen printer port, real time clock, and extra heavy duty onboard power supply with over current protection, over voltage protection and thermal shutdown. If that's not enough then there is the floppy disk controller, guaranteed operation at a 4MHz CPU speed and our 6 month warranty. Every one of these features is *STANDARD*. This is true system expansion. You get every 'expensive' feature without spending more.

CHEAP – Our price is \$399.95. Any way you compare, features or price, LNW's System Expansion II is the clear winner. The LNW System has been field tested for over two years with thousands of users. It works with any DOS, is 100% TRS-80 Model I compatible and it works 'right out of the box'. If there is any doubt in your mind as to whether you should buy ours or the 'other guys', just ask an LNW owner!

WE ARE #1 – Number one in price, features, reliability, performance and delivery. LNW is committed to 'expensive' features and quality at reasonable prices. LNW is committed to support, thorough documentation, and reliability.

LNW Research Corp.

2620 WALNUT Tustin, CA. 92680
(714) 641-8850 (714) 544-5744

This has made us the number one manufacturer of system expansion units and accessories for the Model I computer.

EXPANSION OPTION – 8-inch drive capability is as easy as plugging in the *LNDoubler 5/8* option*. Now you can have any combination of single- or double-density, single- or double-sided, 8** and/or 5" disks on-line! 8-inch disk storage increased to 591,360 bytes – 77-track single-sided, double-density or 1,182,720 bytes – 77-track double-density, double-sided.

The *LNDoubler*'s unique 5/8 switch allows you to boot from 5- or 8-inch system disks and it's accessible from outside the interface. The \$219.95 *LNDoubler 5/8* comes with a double-density disk operating system (DOS+ 3.3.9), complete with BASIC and utility programs... ready to run your software.

Each of your present 40-track, single-sided 5-inch drives will store up to 184,320 bytes (formatted storage) – that's an 80% increase in storage capacity for only half the cost of just one disk drive. With three 8-inch double-density, double-sided drives your Model I will have 3.75 Megabytes of on-line storage – that's more storage than a Model II or Model III!



*8" drive operation requires special cable, 8" double-density requires 3.55MHz CPU speed-up modification or LNW-80 4MHz computer.



Talk to the Big Guys

by Douglas Payne

You can use your Model III as a dumb terminal to access mainframes and minicomputers, taking advantage of their advanced computing features.

At times, I need the computing power and speed of a mainframe or minicomputer, but I also want the convenience of working at home or at my office desk. Since I write terminal emulation software for minicomputer and microcomputer systems as part of my job, I decided to do the same for my Model III. This way, I could take advantage of the capabilities of the larger systems using my computer as a terminal. I've used the software with a large IBM mainframe as well as a UNIX-based minicomputer system.

I'm familiar with a wide variety of in-

teractive terminal systems and programming languages, so my software needs all the functions of a conventional "dumb" terminal. The most important consideration is the ability to enter, from the keyboard, the full 128-character ASCII character set, as well as implement the break signal. It must correctly display all normally displayable characters as well as the control characters that cause cursor movement. It also has to set transmission speed, parity, number of stop bits, and duplex.

I also included features found only in more sophisticated terminals: an audible bell, tab stops, and alternate cursor types. And since I was not really using a terminal, but a computer, I added functions to transfer disk files to and from another computer, load Intel-format object code from a remote computer, and save a profile of all terminal characteristics.

Like most software, this program doesn't provide features that satisfy everyone. I have not included user-translate tables and special function keys, since most of the systems I use already provide them. Anyone familiar with Z80 machine language would have little trouble adding them.

Program Overview

Since the program is fairly large (in excess of 2,000 lines), I divided it into six parts. Although the listings shown here are in Radio Shack's EDTASM

format, a more viable approach would be to use an assembler that generates relocatable code and a linkage-editor to combine object files into an executable module (Microsoft's MACRO-80 and LINK-80, for instance). I have used equates to absolute addresses for those symbols referenced in modules other than the one in which they are defined. Although this method works, it is prone to error and makes changes to the program difficult. I would highly recommend the use of MACRO-80 to anyone contemplating making substantial changes to the program.

The six Program Listings are called UT1/SRC, UT2/SRC, and so on up to UT6/SRC. The first listing consists of the program start-up routines, the basic keyboard, and RS-232 character-handling routines. The second program contains the Intel-format object code loader and its support routines. The third listing comprises the RS-232 I/O drivers. The fourth program deals with parameter selection, and the fifth with file transfers. The sixth listing contains some program variables and constants.

The following is a description of each of the six program listings.

Program Listing 1

The first 48 bytes of Program Listing 1 are reserved for the program stack.

Escape Sequence	Character
[ESC] 0	[NULL] X'00'
[ESC] 1	] X'5D'
[ESC] 2	\ X'5C'
[ESC] 3	^ X'5E'
[ESC] 4	_ X'5F'
[ESC] 5	{ X'7B'
[ESC] 6	} X'7D'
[ESC] 7	| X'7C'
[ESC] 8	~ X'7E'
[ESC] 9	[DEL] X'7F'
[ESC] A	[SOH] X'01'
[ESC] B	[ESC] X'1B'
[ESC] C	[US] X'1F'
[ESC] D	[EM] X'19'
[ESC] >	Receive a file
[ESC] <	Transmit a file
[ESC] [ESC]	Exit to the main menu

Table 1. Escaped characters.

The Key Box

Model III
16K RAM
Assembly Language
Radio Shack Editor Assembler
One Disk Drive

Entry to the program from the system occurs at label UTERM, in line 01360. The old stack pointer is saved and restored prior to exiting to the system, and a new one is set. System routine INITIO ensures that the display input/output (I/O) driver is in its original state so special graphics characters and space compression characters in the various menus display properly. Since RS-232 input is interrupt-driven, the receive interrupt vector points to my interrupt handler (see Program Listing 3).

While the sign-on logo is displayed, the program checks for the existence of the file Profile/TRM. Once found, the file should contain the various option settings saved through option 8 of the main menu (see Program Listing 4).

"Most control characters received from the RS-232 are ignored. Those that aren't receive special treatment because they don't display correctly."

The file consists of a single 256-byte record containing all optional terminal characteristics, as well as the character representations of those settings displayed in the menus. The program reads the record and initializes those settings. Afterward, control passes to LOGON (see Listing 4) to display the main menu, letting the user alter any terminal characteristics.

The remainder of Listing 1 comprises the program's main loop. Control always returns to label CHKRMT in line 02430 to process characters received from the RS-232 interface. If no input is available, control passes to label CHKKBD (line 03290), to process keyboard input. All available characters from the RS-232 input are processed before any keyboard input with the exception of break, but only one keyboard character is processed before returning control to CHKRMT. This scheme gives the RS-232 input priority over the keyboard.

Most control characters received from the RS-232 are ignored. Those that aren't receive special treatment because they don't display correctly. Since

Program Listing 1

```

00100 ;                                UT1/SRC
00110 ;                                ORG      5200H
00120 ;                                EXTERNALS
00130 ;                                BRKTIM EQU      6036H
00140 ;                                CBDMSG EQU      5780H
00150 ;                                CDMSG  EQU      57C6H
00160 ;                                CPMMSG EQU      5798H
00170 ;                                CSTMSG EQU      57B2H
00180 ;                                CVB    EQU      562BH
00190 ;                                DCB    EQU      6044H
00200 ;                                ESCRHS EQU      6025H
00210 ;                                FILBUF EQU      617DH
00220 ;                                FILERX EQU      5E59H
00230 ;                                FILETX EQU      5EFFH
00240 ;                                FLAGS   EQU      6033H
00250 ;                                FLOOFF  EQU      56E2H
00260 ;                                FLOORN EQU      5703H
00270 ;                                FPHEOF EQU      5CE7H
00280 ;                                FPHEOR EQU      5C9EH
00290 ;                                FPHPRM EQU      5CC0H
00300 ;                                FPHSTF EQU      5C75H
00310 ;                                LOADER  EQU      54FAH
00320 ;                                LOGON   EQU      5720H
00330 ;                                RSBAUD  EQU      6034H
00340 ;                                RSRCV   EQU      565CH
00350 ;                                RSTX    EQU      56CEH
00360 ;                                RSTYPE  EQU      6035H
00370 ;                                RXINT   EQU      568CH
00380 ;                                SPSAVE  EQU      607BH
00390 ;                                TABTBL  EQU      6038H
00400 ;                                TRMOPT  EQU      6033H
00410 ;                                PORT ADDRESSES
00420 ;                                RSUART  EQU      0EAH ; RS-232 UART CONTROL PORT
00430 ;                                TXENB   EQU      04H ; - ENABLE TRANSMIT, 0=BREAK
00440 ;                                B1200   EQU      077H ; 1200 BAUD
00450 ;                                CASPRT  EQU      0FFH ; CASSETTE PORT
00460 ;                                ROM ROUTINES
00470 ;                                KBCHAR  EQU      002BH ; GET KEYBOARD CHARACTER
00480 ;                                VDCHAR  EQU      0033H ; DISPLAY CHAR ON SCREEN
00490 ;                                DELAY   EQU      0060H ; DELAY FOR SPECIFIED TIME
00500 ;                                INITIO  EQU      0069H ; INITIALIZE I/O DRIVERS
00510 ;                                VDCLS   EQU      01C9H ; CLEAR SCREEN
00520 ;                                VDLINE  EQU      021BH ; DISPLAY LINE ON SCREEN
00530 ;                                KBRBK   EQU      028DH ; FAST KBD SCAN FOR BREAK
00540 ;                                SCROLL  EQU      0587H ; SCROLL SCREEN UP 1 LINE
00550 ;                                DOS RAM ROUTINES
00560 ;                                OPEN    EQU      4424H ; OPEN DISK FILE
00570 ;                                CLOSE   EQU      4428H ; CLOSE DISK FILE
00580 ;                                READ    EQU      4436H ; READ DISK FILE RECORD
00590 ;                                RAM ADDRESSES
00600 ;                                VIDRAM EQU      3C00H ; VIDEO RAM
00610 ;                                LIN16   EQU      15<6 ; - VIDEO LINE 16
00620 ;                                CAPSLK  EQU      4019H ; CAPS LOCK (0=UPLOW)
00630 ;                                CURSBL  EQU      401CH ; CURSOR BLINK (0=BLINK)
00640 ;                                CURSAD  EQU      4020H ; CURSOR ADDRESS
00650 ;                                CURSCH  EQU      4023H ; CURSOR CHARACTER
00660 ;                                RXIVEC  EQU      4207H ; RS-232 RX INTERRUPT VECTOR
00670 ;                                ASCII CHARACTERS
00680 ;                                STX    EQU      02H ; START OF TEXT (CTRL-B)
00690 ;                                BEL   EQU      07H ; DELL (CTRL-G)
00700 ;                                BS    EQU      08H ; BACK-SPACE
00710 ;                                TAB   EQU      09H ; TAB
00720 ;                                LF    EQU      0AH ; LINE-FEED
00730 ;                                FF    EQU      0CH ; FORM-FEED (CTRL-L)
00740 ;                                CR    EQU      0DH ; CARRIAGE RETURN
00750 ;                                ESC   EQU      1BH ; ESCAPE
00760 ;                                DEL   EQU      7FH ; DELETE
00770 ;                                BREAK EQU      01H ; <BREAK> KEY
00780 ;                                TABUPR EQU      19H ; UPPERCASE <TAB> KEY
00790 ;                                CLEAR  EQU      1FH ; <CLEAR> KEY
00800 ;                                SCREEN CHARACTERS
00810 ;                                CURSON EQU      0EH ; CURSOR ON
00820 ;                                CURSOFF EQU      0FH ; CURSOR OFF

```

Listing 1 continued

```

00990 SWPGRF EQU 15H ; SWAP TO GRAPHICS CHARS
01000 DBLCHR EQU 17H ; SWITCH TO DOUBLE SIZE CHR'S
01010 CURSLT EQU 18H ; CURSOR LEFT
01020 CURSRT EQU 19H ; CURSOR RIGHT
01030 CURSDN EQU 1AH ; CURSOR DOWN
01040 CURSHM EQU 1CH ; CURSOR HOME
01050 CURSSL EQU 1DH ; CURSOR TO START OF LINE
01060 CLSCRN EQU 1FH ; CLEAR TO END OF SCREEN
01070 SPCOMP EQU 0C0H ; SPACE COMPRESSION CHR'S
01080 MICRO EQU 0D3H ; MICRO SYMBOL
01090 ;
01100 ; FLAG BITS
01110 ;
01120 DUPLEX EQU 0 ; - FULL DUPLEX
01130 ESCKBD EQU 1 ; - <ESC> RECEIVED FROM KBD
01140 ESCLIN EQU 2 ; - <ESC> RECV'D FROM REMOTE
01150 XOFFTX EQU 3 ; - <XOFF> SENT TO REMOTE
01160 CRTX EQU 4 ; - <CR> SENT TO REMOTE
01170 XOFFRX EQU 5 ; - <XOFF> RECV'D FROM RMT
01180 ;
01190 ; PROFILE FILE RECORD FORMAT
01200 ;
01210 PRFOPT EQU 0 ; TERMINAL OPTIONS
01220 PRFBM EQU PRFOPT+17 ; 'BAUD'
01230 PRFPAR EQU PRFBM+6 ; 'PARITY'
01240 PRFDUP EQU PRFPAR+4 ; 'DUPLEX'
01250 PRFSTP EQU PRFDUP+4 ; 'STOP BITS'
01260 PRFCCH EQU PRFSTP+1 ; CURSOR CHARACTER
01270 PRFCBL EQU PRFCCH+1 ; CURSOR BLINK
01280 PRFSTF EQU PRFCBL+1 ; 'START-OF-FILE'
01290 PRFEOR EQU PRFSTF+2 ; 'END-OF-RECORD'
01300 PRFRMR EQU PRFEOR+2 ; 'PROMPT'
01310 PRFEOP EQU PRFRMR+2 ; 'END-OF-FILE'
01320 ;
01330 ; ENTER AND SET STACK POINTER
01340 ;
01350 DEFS 48 ; RESERVE STACK SPACE
01360 UTERM EQU $ ; EXECUTION STARTS HERE
01370 LD (SPSAVE),SP ; SAVE OLD STACK PTR
01380 LD SP,UTERM ; SET STACK POINTER
01390 CALL INITIO ; INITIALIZE I/O DRIVERS
01400 ;
01410 ; INITIALIZE RS-232 INTERRUPT VECTOR
01420 ;
01430 LD HL,RXINT ; SET NEW RX VECTOR
01440 LD (RXIVEC),HL
01450 ;
01460 ; INITIALIZE KEYBOARD AND SCREEN
01470 ;
01480 LD A,'_'; SET CURSOR = underscore
01490 LD (CURSCH),A
01500 XOR A ; RESET CAPS LOCK
01510 LD (CAPSLK),A
01520 LD (CURSBL),A ; SET CURSOR BLINK
01530 ;
01540 ; DISPLAY SIGN-ON LOGO
01550 ;
01560 LD HL,LOGO
01570 CALL VDLINE
01580 XOR A ; DELAY ABOUT 5 SECS.
01590 LD B,A
01600 LD C,7
01610 WTLOOP EQU S
01620 DJNZ WTLOOP
01630 DEC A
01640 JR NZ,WTLOOP
01650 DEC C
01660 JR NZ,WTLOOP
01670 ;
01680 ; CHECK FOR PROFILE/TRM
01690 ;
01700 LD HL,FILBUF ; OPEN PROFILE FILE
01710 LD DE,DCB
01720 LD B,0 ; LRL = 0
01730 CALL OPEN
01740 JP NZ,LOGON ; GO TO MAIN MENU IF NONE
01750 ;
01760 ; READ PROFILE, SET PARAMETERS
01770 ;
01780 CALL READ ; READ RECORD
01790 JP NZ,LOGON ; EXIT IF ERROR
01800 LD DE,TRMOPT ; GET TERMINAL OPTIONS
01810 LD BC,17
01820 LDIR
01830 LD DE,CBDMSG ; GET 'BAUD'
01840 LD BC,6
01850 LDIR
01860 LD DE,CPMSG ; GET 'PARITY'
01870 LD BC,4
01880 LDIR

```

a carriage return (X'0D') moves the cursor to the start of the next line, rather than the current one, the cursor-to-start-of-line character (X'1D') appears. The LNFEED routine at line 05230 displays line feed characters (X'0A').

The TRS-80 displays line feed the same as carriage return, so line feed becomes a cursor-down character. However, since a cursor-down displayed on the bottom line of the screen causes the cursor to move to the top line, the system calls the Scroll routine to scroll up one line instead. Back-space (X'08') appears as a cursor-left character so it doesn't erase any characters.

The bell character (X'07') generates an audible tone through the cassette port. In order to hear it you need to connect a small amplifier and speaker to the AUX jack of the cassette cable.

"If the remote system does not support the protocol, characters are lost whenever scrolling takes place, the screen is cleared, a carriage return is displayed, or line-wrap occurs."

The form-feed character (X'0C') clears the screen. The tab character (X'09') moves the cursor to the next tab stop. The sequence ESC, STX (X'1B', X'02') signals that the data following it is Intel-format object code to be loaded into memory (see Listing 2).

Since interrupts are disabled during output to the screen, XON/XOFF flow control occurs whenever the possibility exists that characters will be lost due to scrolling or other lengthy operations. See Listing 3 for a description of this protocol.

If the remote system does not support the protocol, characters are lost whenever scrolling takes place, the screen is cleared, a carriage return is displayed, or line-wrap occurs. The problem occurs only at transmission speeds greater than 300 baud.

The code at label CHKKBD processes keyboard input. Since part of the ASCII character set is unavailable from the keyboard, I devised a method to enter those omitted characters. The two-character sequence [ESC] [character] represents the nonexistent characters.

The Driving Force!

JFD - COCO DISC SYSTEM - \$449

J & M Systems, Ltd. is a leader in the Model III marketplace with our JFD-III Disc Controller. With thousands in operation, we have set new standards in controller performance and reliability. We bring these same high standards to the COCO, resulting in the highest quality disc controller system on the market. Compare these functions before you buy:

- Price: \$449 includes controller, first drive, disc basic in ROM, and menus. Just plug it in.
- Never needs adjusting. Our exclusive Digital Phase Lock Loop Data Separator and Digital Frequency Circuit eliminates the 3 adjustments found on other controllers.
- High quality standard production disc drives. For improved survivor and reliability. Timdon & Teac drives provide twice the read sensitivity that the drives found in other disc systems do, and hold their alignment far longer.
- Gold-plated card edge connectors throughout.
- Software compatible with Radio Shack Disc Basic, Flex, and OS/9.

J & M Systems, Ltd., 137 Utah NE, Albuquerque, N.M. 87108
(505) 265-1501



J&M
J & M SYSTEMS, LTD.

AMERICAN SOFTWARE CLUB NOW HAS 15,000 MEMBERS AND KEEPS ON GROWING.

HERE ARE TEN REASONS WHY:

- 1. PRICE:** ASC promises that members' prices are the lowest available. If you find a lower, nationally advertised price, we will gladly credit your account with the difference.
- 2. NO MINIMUM:** As a Club member you are never obligated to buy anything you don't want.
- 3. FAST SHIPMENT:** The products we offer in our catalog are kept in stock, so orders are usually shipped within 24 hours.
- 4. PRODUCT DESCRIPTIONS:** ASC's bi-monthly Compendium contains extensive product descriptions on every offering so that novice and expert alike know what they are buying.
- 5. WIDE SELECTION:** ASC carries hundreds of programs as well as hardware and supplies for APPLE, ATARI, CP/M, IBM PC, and TRS-80 computers.
- 6. PRODUCT EVALUATION:** Each product sold by ASC must first pass rigorous evaluation before it is included in the Club's offerings.
- 7. PRODUCT SUPPORT:** We believe it is as important to support products as it is to sell them, so we stand behind every product we sell.
- 8. EASE OF ORDERING:** An order form is provided with every catalog, and the Club also provides a toll free number for 24 hour, 7-days-a-week service.
- 9. CONSUMER SERVICES:** The Club provides information and suggestions as to product suitability and compatibility, and can call on the assistance of additional outside sources.
- 10. SPECIAL OFFERS:** Club members will from time to time receive special exclusive offerings that greatly enhance the value of membership.

For A One-Year Trial Membership
With No Fee Or Obligation,
Fill Out The Coupon Or
Call Our Toll Free Number:

1-800-431-2061

(NY Residents call 914-762-5644)

ASC is America's oldest & largest commercial software club.

American Software Club, Inc.
Millwood, New York 10546

Please begin my free one-year trial membership as outlined above.

Name _____

Address _____

City/State/Zip_____

My computer is: APPLE ATARI IBM PC
 TRS-80 (Mod. 1, 2, 3, 4) CP/M (8" or 5 1/4")

Enter the Escape command by pressing the shift and up-arrow keys. This sequence is also used to initiate file transfers, and to exit to the main menu display. Table 1 summarizes the escaped characters.

The break signal is a frequently misunderstood part of terminal-to-computer communications. It generates an error condition in the transmission of data by causing a character to be sent with no stop bit(s). The Model III user's manual contains a good description of the composition of a character as it is transmitted via the RS-232 port. This error condition is detected by the receiving hardware as a framing error and signals an interrupt to the computer.

The TRS-80 generates a break by turning off the transmitter for a period of time. Therefore, when the break key is pressed, the transmitter turns off for the time it takes to send two characters, and then turns back on. Since the time off depends on the transmission speed (baud rate), the delay factor is kept in the variable BRKTIM, which is changed whenever the baud rate is changed. This ensures that the computer receiving the break signal detects it, regardless of the transmission speed.

Control characters received from the keyboard are treated in much the same manner as those received from the

Model 4

Plus

Model 4 64K

2 Tandon Drives

**FREE
SOFTWARE**

Mailing List
Home Budget
Loan Amortization
10 Programs in all!

- TRS DOS 6.0
- FREE SOFTWARE

Price \$1599.
Cash

Model 4 Conversion Kits
For Model III --- \$ Call

Visa - Mastercard
(Add 3% Handling)

ASHLAND COMPUTER
(606)325-2210
Mon. - Fri. 10 to 5 E.S.T.

Listing 1 continued

```

01890 LD DE,CDMSG ; GET 'DUPLEX'
01900 LD BC,4
01910 LDIR
01920 LD A,(FILBUF+PRFSTP) ; GET 'STOP BITS'
01930 LD (CSTMMSG),A
01940 LD A,(FILBUF+PRFCCH) ; GET CURSOR CHAR
01950 LD (CURSCH),A
01960 LD A,(FILBUF+PRFCBL) ; GET CURSOR BLINK
01970 LD (CURSBL),A
01980 LD HL,(FILBUF+PRFSTF) ; 'START-OF-FILE'
01990 LD (FPMSFT),ML
02000 LD ML,(FILBUF+PRFEOR) ; 'END-OF-RECORD'
02010 LD (FPMEO),ML
02020 LD HL,(FILBUF+PRFPRM) ; GET 'PROMPT'
02030 LD (FPMPRM),ML
02040 LD ML,(FILBUF+PRFEEOF) ; GET 'END-OF-FILE'
02050 LD (FPMEOF),ML
02060 LD DE,DCB ; CLOSE FILE
02070 CALL CLOSE
02080 JF LOGON ; GO TO MAIN MENU
02090 ;
02100 ;
02110 ; SIGN-ON LOGO
02120 LOGO EQU $
02130 OEFB CURSHM
02140 DEF B CLSCRN
02150 DEF B DBLCHR
02160 OEFB LF
02170 DEF B LF
02180 DEF B LF
02190 DEF B LF
02200 DEF B SPCOMP+13
02210 DEF B SWFGRP
02220 DEF B MICRO
02230 DEF B SWPGRP
02240 OEFM 'TERM'
02250 DEF B LF
02260 DEF B LF
02270 DEF B SPCOMP+10
02280 DEF M 'Intelligent'
02290 DEF B LF
02300 DEF B SPCOMP+12
02310 DEF M 'Terminal'
02320 DEF B LF
02330 DEF B SPCOMP+12
02340 OEFM 'Emulator'
02350 DEF B LF
02360 DEF B LF
02370 DEF B SPCOMP+9
02380 DEF M 'by Doug Payne'
02390 DEF B CR
02400 ;
02410 ; CHECK FOR REMOTE INPUT (RS-232)
02420 ;
02430 CHKRMT EQU $
02440 CALL KBBRK
02450 JP NZ,CHKRBD ; SCAN FOR KBD BREAK
02460 CALL RSRVC ; PROCESS KBD INPUT IF SO
02470 JP C,CHKRBD ; CHECK FOR INPUT
02480 CP DEL ; CHECK KEYBOARD IF NONE
02490 JR Z,NDISPC ; IS IT <DEL>?
02500 CP '' ; YES - IGNORE
02510 JR NC,DISPC ; IS IT A CONTROL CHAR?
02520 LD HL,FLAGS ; NO - DISPLAY IT
02530 ;
02540 ;
02550 ; CHECK FOR SPECIAL CHARACTERS
02560 CP CR
02570 JR Z,RMTCR ; - <CR>
02580 CP LF
02590 JR Z,RMTLF ; - <LF>
02600 CP BEL
02610 JR Z,RMTBEL ; - <BEL>
02620 CF BS
02630 JR Z,RMTBS ; - <BS>
02640 CP FF
02650 JR Z,RMTFF ; - <PF>
02660 CP TAB
02670 JR Z,RMTTAB ; - <TAB>
02680 CP ESC
02690 JR Z,RMTESC ; - <ESC>
02700 CP STX
02710 JR NZ,NDISPC ; - <STX>
02720 ;
02730 ;
02740 ;
02750 RMTSTX EQU $
02760 BIT ESCLIN,(HL) ; WAS <ESC> LAST CHARACTER?
02770 JR Z,CHKRMT ; NO - IGNORE <STX>
02780 CALL LOADER ; YES - START LOADER

```

Listing 1 continued

Listing 1 continued

```

02790   JR    NDISPC
02800 RMTCR  EQU   $
02810   LD    A,CURSSL ; USE CURSOR START LINE
02820   JR    DISPC
02830 RMTBS  EQU   $
02840   LD    A,CURSLT ; USE CURSOR LEFT
02850   JR    DISPC
02860 RMTFF  EQU   S
02870   LD    A,(RSBAUD) ; IF BAUD >= 1200
02880   CP    B1200
02890   CALL  NC,FLOOFF ; TURN OFF FLOW
02900   CALL  VDCLS  ; CLEAR SCREEN
02910   JR    NDISPC ; NO EXTRA DISPLAY
02920 RMTBEL EQU   S
02930   CALL  BRINGG ; RING BELL
02940   JR    NDISPC ; NO DISPLAY
02950 RMTTAB EQU   S
02960   CALL  TABCHR ; TAB TO NEXT STOP
02970   JR    NDISPC ; NO EXTRA DISPLAY
02980 RMTESC  EQU   S
02990   SET   ESCLIN,(HL) ; INDICATE <ESC> RECEIVED
03000   JR    CHKRMT ; CHECK REMOTE AGAIN
03010 RMTLF  EQU   S
03020   LD    A,(RSBAUD) ; TURN FLOW OFF ...
03030   CP    B1200 ; ... IF BAUD >= 1200
03040   CALL  NC,FLOOFF
03050   CALL  LNFEED ; DISPLAY LINE FEED
03060   JR    NDISPC ; NO EXTRA DISPLAY
03070 ;
03080 ; DISPLAY RECEIVED CHARACTER
03090 ;
03100 DISPC  EQU   S
03110   PUSH  AF      ; SAVE CHARACTER
03120   CALL  CURCOL ; IF IN COLUMN 63 ...
03130   CP    63
03140   JR    NZ,NFLOW
03150   LD    A,(RSBAUD) ; AND BAUD >= 1200
03160   CP    B1200
03170   CALL  NC,FLOOFF ; TURN OFF FLOW
03180 NFLOW  EQU   S
03190   POP   AF      ; RESTORE CHARACTER
03200   CALL  VDCHAR ; DISPLAY CHARACTER
03210 NDISPC EQU   S
03220   LD    HL,FLAGS ; RESET <ESC> FLAG
03230   RES   ESCLIN,(HL)
03240   CALL  FLOOR  ; TURN FLOW BACK ON
03250   JP    CHKRMT ; CHECK REMOTE INPUT AGAIN
03260 ;
03270 ; CHECK KEYBOARD INPUT
03280 ;
03290 CHKKBD EQU   $ ; CHECK FOR KBD CHARACTER
03300   CALL  KBCHAR
03310   OR    A
03320   JP    Z,CHKRMT ; CHECK REMOTE AGAIN IF NONE
03330   LD    B,A ; SAVE CHARACTER
03340   LD    HL,FLAGS ; WAS <ESC> RECEIVED ?
03350   BIT   ESCKBD,(HL)
03360   JR    Z,NOESC ; NO - CONTINUE
03370   RES   ESCKBD,(HL) ; YES - RESET FLAG
03380 ;
03390 ; HANDLE ESCAPE CODES
03400 ;
03410   CP    ESC    ; IS IT DOUBLE <ESC> ?
03420   JP    Z,LOGON ; YES - GO TO LOGON
03430   CP    '>'   ; IS IT > ?
03440   JP    Z,FILERX ; YES - RECEIVE FILE
03450   CP    '<'   ; IS IT < ?
03460   JP    Z,FILETX ; YES - SEND FILE
03470   CP    61H   ; IS IT LOWER-CASE ?
03480   JR    C,NOTLOW ; YES - MAKE UPPER-CASE
03490   AND   255-' '
03500 NOTLOW EQU   $ ; IS IT '0' TO 'D' ?
03510   CALL  CVB   ; NO - TREAT AS NORMAL
03520   JR    C,NOESC
03530   CP    0EH
03540   JR    NC,NOESC
03550   LD    B,0
03560   LD    C,A
03570   LD    HL,ESCHRS ; TRANSLATE
03580   ADD   HL,BC
03590   LD    A,(HL)
03600   CP    ' '
03610   JP    C,SENDc ; IS IT NOW A CTL CHAR ?
03620   LD    B,A ; YES - DON'T DISPLAY
03630   JR    SENDC ; INDICATE DISPLAY
03640 ;
03650 ; HANDLE STANDARD KEYBOARD INPUT
03660 ;
03670 NOESC  EQU   $ ; GO SEND THE CHARACTER
03680 LD    A,B ; RESTORE CHARACTER

```

RS-232; that is, they are made to display correctly on the screen when necessary. However, all control characters from the keyboard are sent to the RS-232 whether or not they are displayed. Most control characters are generated with the shift-down-arrow characters sequence described in the Model III user's manual. Those that aren't require the escape key mechanism described earlier.

Tabs are entered with the right-arrow key. Tab stops are set and cleared with shift-right arrow. To set a tab stop, position the cursor where the stop is desired and press the shift and right-arrow keys. This works as a toggle. Tab stops previously set are cleared.

"... if you select the full-duplex option, characters don't appear when they're entered. The remote computer should echo them back to you if necessary, and they are displayed as received."

The clear key has the same effect as CTRL L: it clears the screen and sends an FF character to the RS-232 port. The up-arrow key generates a [, and pressing control-G rings the bell. Line feed is entered with the down-arrow key. Note that if you select the full-duplex option, characters don't appear when they're entered. The remote computer should echo them back to you if necessary, and they are displayed as received.

The routine TABSET at line 04530 sets or clears tab stops. An 8-byte table TABTBL (see Program Listing 6), stores tab settings. Each of the 64 bits in this table represents a column on the screen. A 1 bit signifies the presence of a tab stop. The routine TABCHR at line 04770 moves the cursor to the next tab stop. Note that once the cursor reaches the end of a line, it advances no further. The BRINGG routine at line 05420 rings the bell, and CURCOL (line 05590) computes the cursor's current screen column relative to zero.

**FOR TRS-80 MODELS 1, 3 & 4
IBM PC, XT, AND COMPAQ**

The MMSFORTH System. Compare.

- The speed, compactness and extensibility of the MMSFORTH total software environment, optimized for the popular IBM PC and TRS-80 Models 1, 3 and 4.
- An integrated system of sophisticated application programs: word processing, database management, communications, general ledger and more, all with powerful capabilities, surprising speed and ease of use.
- With source code, for custom modifications by you or MMS.
- The famous MMS support, including detailed manuals and examples, telephone tips, additional programs and inexpensive program updates, User Groups worldwide, the MMSFORTH Newsletter, Forth-related books, workshops and professional consulting.

A World of Difference!

- Personal licensing for TRS-80: \$129.95 for MMSFORTH, or "3+4TH" User System with FORTHWRITE, DATAHANDLER and FORTHCOM for \$399.95.
- Personal licensing for IBM PC: \$249.95 for MMSFORTH, or enhanced "3+4TH" User System with FORTHWRITE, DATAHANDLER-PLUS and FORTHCOM for \$549.95.
- Corporate Site License Extensions from \$1,000.

If you recognize the difference and want to profit from it, ask us or your dealer about the world of MMSFORTH.

MILLER MICROCOMPUTER SERVICES
81 Lake Shore Road, Natick, MA 01760
(617) 653-6136

✓137

Listing 1 continued

```

03690 CP   ' ' ; IS IT A CONTROL CHAR ?
03700 JR   NC,SENDC ; NO - JUST SEND IT
03710 LD   B,0 ; INDICATE NO DISPLAY
03720 LD   HL,FLAGS ; POINT TO FLAG BYTE
03730 ;
03740 ; CHECK FOR SPECIAL CHARACTERS
03750 ;
03760 CP   BREAK ; - <BREAK>
03770 JR   Z,TXB6K
03780 CP   CR
03790 JR   Z,KBDCR ; - <CR>
03800 CP   BS
03810 JR   Z,KBDBS ; - <BS>
03820 CP   ESC
03830 JR   Z,KBDESC ; - <ESC>
03840 CP   LF
03850 JR   Z,KBDLF ; - <LF>
03860 CP   BEL
03870 JR   Z,KBDSEL ; - <BEL>
03880 CP   TAB
03890 JR   Z,KBDTAB ; - <TAB>
03900 CP   TABUPG
03910 JR   Z,TABSET ; - <TAB> UPPERCASE
03920 CP   FF
03930 JR   Z,KBDFP ; - <FP>
03940 CP   CLEAR
03950 JR   NZ,SENDC ; - <CLEAR>
03960 ;
03970 ;
03980 ;
03990 KBDFF EQU   $ ; HANDLE SPECIAL CONTROL CHARACTERS
04000 BIT   DUPLEX,(HL) ; FULL-DUPLEX ?
04010 CALL  Z,VDCLS ; NO - CLEAR SCREEN
04020 LD   A,FF ; SEND <FF>
04030 JR   SENDC
04040 KBDCR EQU   $ ; DISPL CURSOR START LINE
04050 LD   B,CURSSL
04060 JR   SENDC
04070 KBOBS EQU   $ ; DISPLAY CURSOR LEFT
04080 LD   B,CURSLT
04090 JR   SENDC
04100 KBDBEL EQU   $ ; PULL-DUPLEX ?
04110 BIT   DUPLEX,(HL)
04120 CALL  Z,BRINGG ; NO - RING BELL
04130 LD   B,0 ; NO DISPLAY
04140 JR   SENDC
04150 KBDESC EQU   $ ; INDICATE <ESC> RECEIVED
04160 SET   ESCKBD,(HL)
04170 JP   CHKRNT ; NO TX OR DISPLAY
04180 KBDTAB EQU   $ ; FULL-DUPLEX ?
04190 BIT   DUPLEX,(HL)
04200 CALL  Z,TABCHR ; NO - TAB TO NEXT STOP
04210 LD   A,TAB ; 2ND <TAB>
04220 LD   B,0 ; NO DISPLAY
04230 JR   SENDC
04240 TKBRK EQU   $ ; GET CHARACTERISTICS BYTE
04250 LD   A,(RSTYPE)
04260 AND   255-TKENB ; TURN OFF TX TO SEND BREAK
04270 OUT   (RSUART),A
04280 LD   BC,(B8KTIN) ; DELAY 2 CHARACTER TIMES
04290 CALL  DELAY
04300 LD   A,(RSTYPE)
04310 OUT   (RSUART),A ; TURN TRANSMIT BACK ON
04320 JP   CHKRNT ; NO TX OR DISPLAY
04330 KBDFL EQU   $ ; FULL DUPLEX ?
04340 BIT   DUPLEX,(HL)
04350 CALL  Z,LNFEED ; NO - DISPLAY LINE FEED
04360 LD   A,LF
04370 LD   B,0 ; NO DISPLAY
04380 ;
04390 ;
04400 ;
04410 SENDC EQU   $ ; SEND RECEIVED CHARACTER TO REMOTE
04420 CALL  RSTX ; SEND CHARACTER TO REMOTE
04430 LD   A,B ; ANY DISPLAY ?
04440 OR    A
04450 JP   Z,CHKRMT ; NO - CHECK REMOTE AGAIN
04460 LD   HL,PLAGS ; FULL-DUPLEX ?
04470 BIT   DUPLEX,(HL)
04480 CALL  Z,VDCHAR ; NO - DISPLAY IT
04490 JP   CHKRMT ; CHECK REMOTE AGAIN
04500 ;
04510 ;
04520 ;
04530 TABSET EQU   $ ; TAB SET PROCESSING
04540 CALL  CURCOL ; GET CUREDA COLUMN
04550 LD   C,A
04560 AND   7
04570 INC   A ; A = BIT OFFSET 1-0
04580 SRL   C

```

Listing 1 continued

ARE YOU TIRED OF BLASTING ALIENS?

Have you had too much of firing laser cannons, guarding fuel cannisters, eating ghosts, avoiding missiles, and just plain getting killed off in pursuit of a few points? Or maybe you never really liked arcade games in the first place; either way, there is a program that you shouldn't be without. The name of this program:

SUPREME RULER

You become leader of a small and struggling country, attempting to stay alive, and expand if you can. Your government will have to deal with the many things every government runs in to; things like protecting your economy (or else risk a recession), providing services and food for your people, stimulating industry and encouraging new business, managing your government revenues, and controlling your army. From 1 to 4 players can take part if you have 16K of memory, or up to 9 players with more memory. If you don't have enough people around, you can assign any number of the countries for the computer to control. (The computer is a worthy opponent, and it plays by all the rules!) You won't quickly become tired of this program, since you will have to make very many decisions to become a successful ruler; you must ponder tax rates, food distribution, government services, large-scale loans, your army's status, your battles, and much more. Included with the program is a 40 Page Handbook on how to rule a country successfully. (It is 8 1/2 by 11 inches, spiral bound; most business programs don't have a manual as good as ours!) The program is top-quality with excellent input and display routines. The 16K and 32K versions are provided together on cassette; the 32K version contains a SAVE GAME feature. PRICE: \$18.50 A 32K version (with SAVE GAME) is provided on diskette. PRICE: \$20.50

For those of you with 48K: SUPREME RULER PLUS!

We fill up the extra memory with features such as Research/Development spending to make your army more efficient, a credit rating system, expanded reports for information about your country, more intelligent computer opponents, selectable computer "skill levels" (the computer countries can be anything from "Defensive" to "Aggressive"), and MUCH MORE!

With a 50+ Page manual (re-written specifically for SUPREME RULER +), and the program provided on either Cassette or Diskette. PRICE: \$26.50
(Note: Any SUPREME RULER Purchaser can upgrade to SUPREME RULER + at any time by returning the original disk/cassette and paying only the difference in price plus \$1 shipping.)

AND FOR THOSE OF YOU WHO ARE NOT TIRED OF ARCADE GAMES . . .

EXTERMINATE!

This 100% Machine Language program will challenge any arcade-game player. An original idea (as far as we know), in which your job is to prevent hordes of alien "BUGS" from escaping out of an underground cavern, by destroying ("Exterminating") them. For the novice, this game becomes only gradually more difficult, so as not to intimidate the player. But for an advanced player, there are methods of getting to the higher skill levels very quickly. EXTERMINATE! is a game with quality graphics and sound, and surprises to keep you busy at every new skill level.

EXTERMINATE: 16K and 32K versions on same Cassette - \$15.50
Model I/III 32K program on Diskette - \$17.50

CLEARANCE!!!

We constantly examine and update our software offerings in order to make sure that they all live up to our current high standards of quality, and sometimes we remove a program from our line-up. This recently happened to our battle-simulation program, The BATTLE of ZEIGHTY. So now we have stopped producing it, but we still have a pile of them stocked up in our inventory. To get rid of them, we've cut the price IN HALF! (Previous purchasers have been compensated.) With this special offer there will be no warranty other than the Media Guarantee. (There will be no updates or returns.)

This is not to say that The BATTLE of ZEIGHTY isn't a good program; it is a well-made one player game. It allows you to set up a small army to your own specifications, and then you must use it to try to take over the fictional Zeightly Pass. You give each of your army divisions specific orders, while the computer plays the defending army. The display is satisfactory, consisting of a "Map" that shows the position of the army divisions. Land features (terrain) are not taken in to account, but you'll have enough to keep you busy. The program contains a wide set of commands and options (such as mines, artillery, 4 different division types, and more). It also has a built-in "HELP" function.

With a 20 page, full size manual; for 16K, Cassette - \$ 8.95
32K, Diskette - \$10.95

OUR "TRIPLE PROTECTION" GUARANTEE

In today's software world it is hard to tell a good program from a bad one by only a magazine ad; that's why JMG has a warranty plan that will guarantee your satisfaction. Here is our "Triple Protection" guarantee:

- 1) **QUALITY GUARANTEE:** If you are unsatisfied with the software product you have purchased, you may return it (in good condition) within 14 days for a refund, less a \$2 handling charge. (We also ask that you send us a brief letter stating the reason for your return.)
- 2) **UPDATES GUARANTEE:** We always listen to our customers, and we often improve and expand our software products on the basis of their comments. If we make an improvement to a product and release a new version, all our previous purchasers will be notified and offered the update. To receive an update, you only have to return your original disk plus \$1 for shipping costs.
- 3) **MEDIA GUARANTEE:** The diskette or cassette has a Lifetime Guarantee. If yours turns out to be defective, or it fails and you do not have any backups made, then just return the disk/cassette and we'll replace it.

TO ORDER:

Just pull out a piece of paper and write the following information down:

- 1) Your name and address (including zip/postal code)
- 2) The program you would like.
- 3) Disk or Cassette?
- 4) State the computer you own. (Model I or III? How many Disk drives? 16K, 32K, or 48K?)
- 5) Enclose either payment (check / money order) OR Credit Card name & number, and expiry date.
- 6) Mail it to JMG, to either of our addresses.
OR

Go and see your nearest dealer. If he doesn't carry JMG programs, shout at him a bit.

DEALER INQUIRIES INVITED

Software Authors: Do you have a new and original program? Why not check us out! Our royalties are worth looking in to.

**JMG SOFTWARE
INTERNATIONAL**

✓ 126

THE FINE PRINT:

We accept VISA and MasterCard.

All prices in U.S. Funds.

Please allow 1 or 2 weeks for PERSONAL CHECKS to clear.

SHIPPING CHARGES are \$2.00 in North America, \$5.00 overseas.

If you order 2 or more programs, there is no shipping charge

in North America; 1/2 charge (\$2.50) overseas.

P.O. BOX 598
FALLS STATION,
NIAGARA FALLS, N.Y.
U.S.A. 14303
OR

710 UPPER JAMES ST.
HAMILTON, ONTARIO
CANADA L9C 2Z8
(416) 389-6088

Awesome!

USCF rated
1793/5*

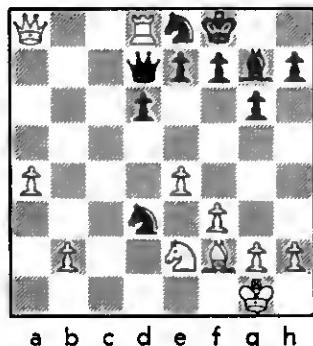
SFINKS 4.0

with user friendly features

Second Kissimmee Open Rd 2

White: Sfinks 4.0 Black: Human 1830

White	Black	White	Black
1. e2-a4	c7-c5	17. d4-e2	d7-e5
2. g1-f3	d7-d6	18. d3-c2	e5-c4
3. d2-d4	c5-d4	19. e3-i2	b5-b4
4. f1-b5+	c8-d7	20. c2-b3	a6-a5
5. b5-d7+	d8-d7	21. d1-d4!	b7-b5
6. f3-d4	g8-f6	22. c3-b4	e5-b4
7. b1-c3	g7-g6	23. a1-c11	c4-b6
8. a1-g1	f8-g7	24. c1-c8+	b6-c8
9. c1-e3	e8-g8	25. b3-c4	b5-d7
10. d1-d3	a7-a6	26. c4-b4	c8-a7
11. c3-d5	b7-b5?	27. b4-b6+	f6-e8
12. d5-b6	d7-b7	28. d4-c4	e7-c6
13. b6-a6	b7-a6	29. b8-a8	c6-e5
14. f2-i3	b8-d7	30. c4-c8	g8-f8
15. f1-d1	f8-c8	31. a2-a4	e5-d3
16. c2-c3	a8-b7	32. c8-d8!	resigns



SFINKS 4.0 CHESS, 48 K, disk only. Only \$49.95. Please specify Model I, III or IV.

SFINKS 3.0 CHESS, 32K, disk or tape. Only \$34.95. Please specify Model I (E.I.), III or IV.

SFINKS CHESS TUTOR, 32K disk only. Only \$19.95. Please specify Model I, III or IV.

To order, please see your dealer or send check plus \$2.00 shipping to:

WILLIAM FINK
Suite 24-B, 1105 N. Main St.
Gainesville, FL 32601
or call (904) 377-4847



✓226

Florida residents add 5% sales tax.
*On Model 3 w/speedup by Holmes Eng.

Listing 1 continued

```

04590    SRL    C
04600    SRL    C ; C = BYTE OFFSET 0-7
04610    LD     B,0
04620    LD     HL,TABTBL
04630    ADD    HL,BC
04640    LD     B,A
04650    XOR    A
04660    SCF
04670    TBSBIT EQU   $
04680    RR    A ; SET OBJECT BIT
04690    DJNZ   TBSBIT
04700    LD     B,(HL) ; INVERT TAB SETTING
04710    XOR    B
04720    LD     (HL),A
04730    JP     CHKRHT ; NO TX OR DISPLAY
04740    ;
04750    ; TAB CHARACTER PROCESSING
04760    ;
04770    TABCHR EQU   $
04780    CALL   CURCOL ; GET CURSOR COLUMN
04790    CP    63 ; EXIT IF AT END OF LINE
04800    JR    Z,TBEXIT
04810    LD     C,A ; CURSOR COLUMN
04820    LD     HL,TABTBL ; TAB TABLE ADDRESS
04830    XOR    A ; COLUMN COUNTER
04840    LD     D,8 ; TAB TABLE COUNTER
04850    TBTGET EQU   $
04860    LD     E,(HL) ; GET TABLE BYTE
04870    LD     B,0 ; SHIFT COUNT
04880    PUSH   AF
04890    LD     A,E
04900    OR    A ; IF TABLE BYTE = 0
04910    JR    NZ,TBNONZ
04920    POP    AF
04930    ADD    A,B ; INCREMENT COL COUNT + 8
04940    JR    TBNEXT ; CHECK NEXT TABLE BYTE
04950    TBNONZ EQU   $
04960    POP    AF
04970    TBSHFT EQU   $
04980    RL    E ; GET TAB SET BIT
04990    JR    NC,TBOFF ; IF ON ...
05000    CP    C ; IF PAST CURRENT COLUMN ...
05010    JR    Z,TBOFF
05020    JR    NC,TBCOMP ; HAVE NEXT TAB STOP
05030    TBOFF EQU   $
05040    INC    A ; INCREMENT COL COUNT
05050    DJNZ   TBSHFT ; CHECK NEXT BIT
05060    TBNEXT EQU   $
05070    INC    HL ; POINT TO NEXT TABLE BYTE
05080    DEC    D ; UNTIL ALL DONE
05090    JR    NZ,TBTGET
05100    DEC    A ; FORCE COL 64
05110    TBCOMP EQU   $
05120    SUB    C ; TAB DISTANCE
05130    LD     B,A
05140    LD     A,CURSR ; TAB TO NEXT STOP
05150    TBTAB EQU   $
05160    CALL   VDCHAR
05170    DJNZ   TBTAB
05180    TBEXIT EQU   $
05190    RET
; RETURN TO CALLER
05200    ;
05210    ; DISPLAY LINE-FEED CHARACTER
05220    ;
05230    LNFEED EQU   $
05240    LD     HL,(CURSAD) ; ON LINE 16 ?
05250    LD     BC,VIDRAM+LIN16
05260    OR    A
05270    SBC    HL,BC
05280    JR    C,NOSCRL ; NO - DON'T SCROLL
05290    LD     A,CURSOF ; TURN OFF CURSOR
05300    CALL   VDCHAR
05310    CALL   SCROLL ; SCROLL UP 1 LINE
05320    LD     A,CURSON ; TURN CURSOR BACK ON
05330    CALL   VDCHAR
05340    RET
; RETURN TO CALLER
05350    NOSCRL EQU   $
05360    LD     A,CURSON ; MOVE CURSOR DOWN
05370    CALL   VDCHAR
05380    RET
; RETURN TO CALLER
05390    ;
05400    ; RING BELL THROUGH CASSETTE PORT
05410    ;
05420    BRINGG EQU   $
05430    LD     C,CASPR7 ; CASSETTE PORT ADDRESS
05440    LD     A,1 ; INITIAL SOUND VALUE
05450    LD     B,128 ; DELAY VALUE
05460    NXTWAV EQU   $
05470    PUSH   BC ; SAVE DELAY
05480    OUT    (C),A ; OUTPUT WAVE LOGIC

```

Listing 1 continued

```

05490 LD B,32 ; FREQUENCY COUNTER
05500 DJNZ $ ; WAIT A BIT
05510 XOR 3 ; FLIP WAVE LOGIC
05520 POP BC ; RESTORE DELAY COUNT
05530 DJNZ NXTWAV ; UNTIL DONE
05540 LD A,BEL ; RESTORE CHARACTER
05550 RET ; RETURN TO CALLER
05560 ;
05570 ; COMPUTE CURRENT CURSOR COLUMN
05580 ;
05590 CURCOL EQU $ ; GET CURSOR ADDRESS
05600 LD HL,(CURSAD) ; MAKE RELATIVE TO 0
05610 LD DE,VIDRAM ; COMPUTE COLUMN
05620 XOR A
05630 SBC HL,DE
05640 LD A,L
05650 AND 63
05660 RET ; RETURN TO CALLER
05670 END UTERM

```

Program Listing 2

Program Listing 2 calls the Loader routine at line 00330 whenever it receives the escape key-[STX] sequence from the RS-232. It loads Intel-format object code into memory. Table 2 describes this object code. The object file must have this format for the loader to work correctly.

The lowest and highest address locations loaded are stored and displayed along with the entry point address when the load is complete. The program displays the load address of each record as it is received. A message informs you when a checksum error occurs, but the

Offset **Contents**

- 0 : (indicates start of record)
- 1 Two hexadecimal characters representing the length of object code in the record.
- 3 Four hexadecimal characters specifying the address at which the code will be loaded.
- 7 Two hex digits giving the record type:
'00' the record contains object code.
'01' end record, load address is the entry point address.
- 9 n pairs of hexadecimal digits containing the object code, where n is the length specified at offset 1.
- 9 + 2n Two hexadecimal digits representing the checksum, which is such that the sum of all the bytes of code, address, length, record type, and checksum is equal to 0 modulo 256.

Table 2. Intel-format object code.

"When the load is complete, regular terminal operations resume."

load continues. When the load is complete, regular terminal operations resume. To save the loaded code, exit to TRSDOS and use the Dump command to create a command file.

The routines GETBYT (line 01590), GETDIG (line 01790), and CVB (line 01890) read a pair of hexadecimal (hex) digits and return their binary value. The routine CVH at line 02070 converts a word to four hex digits for display.

This loader doesn't check for invalid load addresses or program code that overlays part of the terminal program. It could hang up waiting for correct data if you failed to use a valid Intel-format object file.

Program Listing 2

```

00100 ;
00110 ; UT2/SRC
00120 ;
00130 QRG 54FAH
00140 ;
00150 ; EXTERNALS
00160 ;
00170 RSRCV EQU 565CH
00180 ;
00190 ; ROM ROUTINES
00200 ;
00210 VDCLS EQU 01C9H ; CLEAR SCREEN
00220 ;
00230 ; RAM ADDRESSES
00240 ;
00250 VIDRAM EQU 3C00H ; VIDEO RAM
00260 LIN14 EQU 13<6 ; - VIDEO LINE 14
00270 LIN15 EQU 14<6 ; - VIDEO LINE 15
00280 LIN16 EQU 15<6 ; - VIDEO LINE 16
00290 ;
00300 ; LOAD INTEL FORMAT OBJECT CODE
00310 ; :NN AAAA TT B1 B2 ... BN CS
00320 ;
00330 LOADER EQU $ ; SET INITIAL LOAD LIMITS
00340 LD HL,-1 ; SET INITIAL LOAD LIMITS
00350 LD (LOADADDR),HL ; DISPLAY INITIAL MESSAGE
00360 INC HL
00370 LD (HIADDR),HL
00380 CALL VDCLS ; DISPLAY INITIAL MESSAGE
00390 LD HL,LDMMSG ; ALL STANDARD MATH FUNCTIONS PLUS
00400 LD DE,VIDRAM+LIN14 ; HYPERBOLICS, SIGMA, DELTA, FACTRIAL.
00410 LD BC,LDMMSG ; COMPILED MULTIDISC SET $150.
00420 LDIR ; SPECIFY IRS 80+ MOD I OR III
00430 ;
00440 ; READ CONTROL DATA
00450 ;
00460 CONTRL EQU $ ; INTERNATIONAL COMMUNICATION EXPERTS

```

Listing 2 continued

:DISTANCE:=X1: VELOCITY:=*X2:TIME:

MATH ANALYZER PAK™

AN EXPANDABLE SOFTWARE TOOL
SCREEN DSPLY FRMD SINGLE KEY FUNC-
TION CONTROLS. EXECUTE; STORE IN REG-
ISTERS OR SAVE TO DISC.
EQUATIONS AND SCIENCE TABLES

PREPROGRAMMED DISCS FOR:
CONVERSIONS, GEOMETRIC FIGURES, DERIV-
ATIVES, INTEGRALS, SIMULTANEOUS EQUA-
TIONS, PHYSICAL QUANTITIES, CHEMICAL
ELEMENTS, STELLAR, GEODESICS, MICROWAVE,
BESSEL FUNCTIONS, PERMUTATIONS, SPACE-
TIME, AND MORE.

ALL STANDARD MATH FUNCTIONS PLUS
HYPERBOLICS, SIGMA, DELTA, FACTRIAL.

COMPILED MULTIDISC SET \$150.
SPECIFY IRS 80+ MOD I OR III

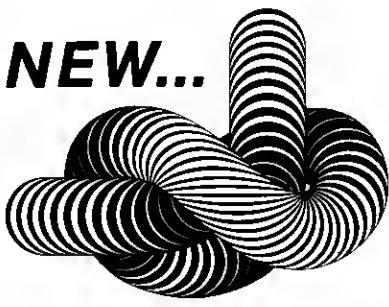
INTERNATIONAL COMMUNICATION EXPERTS
P.O. BOX 6734
DENVER, COLORADO 80208

✓234

303-572-7522

TM Tandy Corp

NEW...



SOFTWARE FROM SON

MAZE A PHRASE WORD GAME

A real brain teaser. Compete with others by choosing a letter to build words and score points to solve the popular mystery phrase. Can be played with an unlimited number of phrases or words. It will provide hours of fun, challenge and education for the whole family. (2 to 9 players)
\$16.95 TAPE \$20.95 DISK \$7.95 LLIST

DOT TO DOT CHALLENGE GAME

Just connect the dots to score as many boxes as you can to win. Points awarded and different grid sizes make it as challenging as you want. A game of skill and fun for ages 8 to adult.

\$9.95 TAPE \$12.95 DISK \$4.95 LLIST

STAIR CONSTRUCTION PLANNING AIDE

Two-for-one special. Take a step up and build your own stair plans by using the Stair Construction Planning Aid. Designs standard or spiral type stairs. Saves time and money. Great for either the do-it-yourselfer or the construction trade professional.

\$9.95 TAPE \$12.95 DISK \$4.95 LLIST

Send check, money order, or COD accepted.

Dealer Inquiry welcome.

Minimum Systems Required: Model I Level II, III, IV or COCO - 16K RAM.

Post paid in North America. Outside North America add 15% for air mail. Wisconsin residents add 4% tax.

SON SOFT

905 North 21st Street, Superior, WI 54880

Phone 1-715-394-7853

✓292

"This year Uncle Harry went to..."
(Who's Uncle Harry?)

DO YOU HATE (CHRISTMAS) PORM LETTERS?

Don't burden your friends or clients with needless information. Your letters will be automatically customized.

LET'R'R WRYT
composes paragraphs and selectively places them into letters to match your common interest codes. Write some or all of your friends or clients. Each letter can be unique. All paragraphs and addresses are stored safe on disc.

SPECIAL FEATURES:

Each paragraph goes to only those who will be interested in it, per common interest codes stored permanently in the address file.

completely MENU DRIVEN
and prompted
no training necessary

live keyboard

convenient file update

dozens of options programmed in for user friendly execution-
format, greeting, closing,
nickname, updating,
search, sort, etc.

600 names/disk on models 1,3,4

PRICE \$29.99 until Oct 1, then \$35.99

to order call 313-683-5094

or write:

Meyer's Place
5132 Kithon Lane
West Bloomfield Mi, 48033

MC,VISA,CHECK

Listing 2 continued

```

00470 CALL RSRCV ; READ A BYTE
00480 JR C,CONTRL ; UNTIL COLON RECEIVED
00490 CP ':' ; ZERO CHECKSUM BYTE
00500 JR NZ,CONTRL ; READ LOAD ADDRESS
00510 XOR A
00520 LD C,A ; READ TEXT LENGTH BYTE
00530 CALL GETBYT ; SAVE FOR LATER
00540 LD B,A ; READ LOAD ADDRESS
00550 CALL GETBYT ; READ CONTROL BYTE
00560 LD M,A ; 0 => TEXT CARD
00570 CALL GETBYT ; IGNORE ALL OTHER TYPES
00580 LD L,A ; END CARD
00590 CALL GETBYT ; NEW LOW ?
00600 CP 1 ; 1 => END CARD
00610 JR Z,LDREND
00620 OR A ; 0 => TEXT CARD
00630 JR NZ,CONTRL ; IGNORE ALL OTHER TYPES
00640 ;
00650 ; PROCESS NEW LOAD ADDRESS
00660 ;
00670 PUSH HL ; SAVE LOAD ADDRESS
00680 LD DE,(LOADADDR) ; NEW LOW ?
00690 OR A
00700 SBC HL,DE
00710 PDP HL
00720 JR NC,LADISP
00730 LD (LOADADDR),HL ; YES - SAVE IT
00740 LADISP EQU $ ; NO
00750 PUSM BC
00760 PUSH HL
00770 LD DE,LDADDR ; DISPLAY LOAD ADDRESS
00780 CALL CVH
00790 LD HL,LDADDR
00800 LD DE,VIDRAM+LIN14+LDMMSG
00810 LD BC,4
00820 LDIR
00830 PDP HL
00840 POP BC
00850 LD A,B ; LOAD LENGTH = 0 ?
00860 OR A
00870 JR Z,CHKSUM ; YES - PROCESS CHKSUM BYTE
00880 ;
00890 ; LOAD OBJECT TEXT
00900 ;
00910 TEXT EQU $ ; READ OBJECT BYTE
00920 CALL GETBYT ; LOAD OBJECT BYTE
00930 LD (HL),A ; INCREMENT LOAD ADDRESS
00940 INC HL
00950 DJNZ TEXT ; DECREMENT LOAD LENGTH
00960 PUSH HL ; SAVE LOAD ADDRESS
00970 LD DE,(HIADDR) ; HAVE NEW HIGH ?
00980 OR A
00990 SBC HL,DE
01000 POP ML
01010 JR C,CHKSUM
01020 LD (MIADDR),HL ; YES - SAVE IT
01030 ;
01040 ; CHECKSUM BYTE IS NEXT
01050 ;
01060 CHKSUM EQU $ ; READ CHECKSUM BYTE
01070 CALL GETBYT ; CHECKSUM = 0 ?
01080 LD A,C
01090 OR A
01100 JR Z,CONTRL ; YES - CONTINUE LOAD
01110 LD HL,LDADDR ; NO - DISPLAY WARNING
01120 LD DE,CSUMAD
01130 LD BC,4
01140 LDIR
01150 LD HL,CSUMER
01160 LD DE,VIDRAM+LIN15
01170 LD BC,CSUMEL
01180 LDIR
01190 JR CONTRL ; LOOK FOR NEXT CARD
01200 ;
01210 ; END CARD ENCOUNTERED
01220 ;
01230 LDREND EQU $ ; READ LAST CHECKSUM BYTE
01240 CALL GETBYT ; INSERT TRA IN MESSAGE
01250 LD DE,LDTRA
01260 CALL CVM
01270 LD HL,(LOADADDR) ; INSERT START IN MESSAGE
01280 LD DE,LDSTA
01290 CALL CVH
01300 LD HL,(HIADDR) ; INSERT END IN MESSAGE
01310 DEC HL
01320 LD DE,LDEND
01330 CALL CVH
01340 LD HL,LDONE ; DISPLAY DONE MESSAGE
01350 LD DE,VIDRAM+LIN16
01360 LD BC,LDONEL

```

Listing 2 continued

TCS Heart of TEXAS COMPUTER SYSTEMS

IBM Personal Computer

INTERNAL DISKS FDR IBM
Tandon Internal Disk-160K ... \$CALL
Tandon Internal Disk-320K ... \$CALL

HARD DISKS FOR IBM
Complete 5 Meg Systems from ... \$1550
Multi-computer Network Systems.
QUADBOARD FOR IBM
Includes 64K to 256K additional memory
Serial & Parallel Port and Calendar Clock

PRINTERS FOR IBM
STAR and EPSON ... \$CALL
NEC 3550 Spinwriter ... \$CALL

MONITORS
Med Hi Res-Green Comrex ... \$89
High Res-Green BMC from ... \$89
High Res-Color PGS \$CALL
Matches IBM PC
Low Res-Color-Taxon Vision 1 ... \$CALL
High Res-Color-Taxon Vision 1 ... \$CALL
High Res-Green-Taxon ... \$CALL

CORVUS

5 Megabyte Hard Drive ... \$CALL
10 Megabyte Hard Drive ... \$CALL
20 Megabyte Hard Drive ... \$CALL

Add 5, 10 or 20 Megabytes of storage to your TRS-80 Model 1, Model II, Model III, Model 12, IBM, Apple, Atari, Heath, Zenith, Interfex, S100, Osborne, Eagle, Commodore 64, Xerox, Superbrain, Z89/90, DEC LSI-11, NEC PC-8001, and more.

One or several computers can share A HARD DISK
Ask about OMNINET for your Apple or IBM PC.



Dedicated
To Being No. 1!

FEATURES

- 100 CPS
- 9X9 Dot Matrix
- True Decenders
- Super Script-Subscript-Underlining
- Friction and Tractor
- Programable Line Spacing
- 99% Compatible with software written for No. 1 Printer.
- High Res Bit Image Block Graphics
- Backspacing-Doublestrike-And More
- 5, 6, 8 1/2, 10, 12 and 17 Pitch
- Free 2.3K Buffer

Extended Six (6) Months Factory Warranty--FREE!

Gemini 10 (9 inch Carriage) Friction and Tractor ... \$CALL
Gemini 15 (15 inch Carriage) Friction and Tractor ... \$CALL
Serial Interface ... \$CALL
Apple Card and Cable ... \$CALL
Commodore Interface ... \$CALL

COMMODORE 64

VIC 20--DISK DRIVES--MONITORS
DATASETTES--SOFTWARE
ACCESSORIES

Call For Current Pricing Information.

PRINTERS

TCS has the LOWEST PRICES on IN-STOCK PRINTERS

LETTER QUALITY PRINTERS

C.ITOH F-10 (40 CPS)
DAISY WHEEL II (RS)
NEC 3510-3650
NEC 7710/7730
BROTHER COMREX

PRINTER CABLES AND INTERFACES AVAILABLE.
CALL FOR CURRENT PRICING INFORMATION.

LEADER in MAIL ORDER DISCOUNTS!

800 433-5184

Texas 817/274-5625

TCS MODEL III 48K 2 DISK

Systems come with 180 day warranty.

\$1444

With standard 40 track
double density drives
Over 340,000 bytes
includes TDOS

\$1644

With 2 dual headed 40
track dbl. density drives
Over 730,000 bytes
Includes DOSPLUS 3.4
(\$150 value)

Fully assembled and tested systems that are software compatible and functionally identical to Radio Shack units sold at computer stores for hundreds more.

CONTROLLER BOARDS are high quality double sided epoxy boards with gold plated contacts

POWER SUPPLY is the finest switching type available

MOUNTING HARDWARE includes power and data cables.

DISK DRIVES are Tandon, the same ones used by Radio Shack .40 track, double density, with a 5 millisecond stepping rate

TCS MODEL III DISK EXPANSION KITS

1 Controller, Power Supply, Mounting Hardware & Instruction	... \$279
2 Controller, Power Supply, Mounting Hardware & one 40 track Tandon Drive	\$478
3 Controller, Power Supply, Mounting Hardware & two 40 track Tandon Drive	\$677
3A Kit 3 but with two 80 track drives (dual 40's)	\$879
3B Kit 3 but with two 160 track drives (dual 80's)	\$1099

TCS Model III and Color Computer

Ask about the Green or Amber CRT for your customized Model III

TRS-80

Model III and Color Computer

With Original 90 day Manufacturer's Limited Warranty
Call for current pricing information on the

Model II...Model 16...Model 12...Model 4

All Radio Shack Equipment shipped from our store in
Brady, Texas.

Tandon

TCS DRIVE CABINET is industrial grade heavy gauge metal, safely fused, and comes with gold plated external connector with extender cable

1 DRIVE in Cabinet

40 track single sided ...	\$249
80 track (dual sided 40 track) ...	\$329
160 track (dual sided 80 track) ...	\$449

1 DRIVE/Double Cabinet

40 track single sided ...	\$289
80 track (dual sided 40 track) ...	\$389
160 track (dual sided 80 track) ...	\$499

2 DRIVES/Double Cabinet

40 track single sided ...	\$489
80 track (dual sided 40 track) ...	\$639
160 track (dual sided 80 track) ...	\$849

Drives in cabinets come assembled/tested with power supply. Order cable separately

BARE DRIVES ONLY

40 track single sided ...	\$CALL
80 track (dual sided 40 track) ...	\$CALL
160 track (dual sided 80 track) ...	\$CALL
8 inch Slimline sgl/dbl sided	\$CALL
Winchester Hard Drives 5-30 Meg	\$CALL

Smith-Corona®

TP-I

Parallel/Serial \$535

TEXAS COMPUTER SYSTEMS

P.O. Box 1327 Arlington, Texas 76004-1327

TECHNICAL ASSISTANCE 817/274-9221
ORDER STATUS 817/277-1913
TELEX/TWX/Easylink ELN 62100790



800 433-5184

No tax out of state. Texans add 5%. Prices subject to change at any time.

REMsoft, INC.

Let Your TRS-80® Teach You ASSEMBLY LANGUAGE

Tired of buying book after book on assembly language programming and still not knowing your **POP** from your **PUSH**?

REMsoft proudly announces a more efficient way, using your own TRS-80® to learn the fundamentals of assembly language programming...at YOUR pace and YOUR convenience.

Our unique package, "INTRODUCTION TO TRS-80® ASSEMBLY PROGRAMMING," will provide you with the following:

- Ten 40 minute lessons on audio cassettes
- A driver program to make your TRS-80® video monitor serve as a blackboard for the instructor.
- A display program for each lesson to provide illustration and reinforcement for what you are hearing.
- Step-by-step dissection of complete and useful routines to test memory and to gain direct control over the keyboard, video monitor, and printer.
- How to access and use powerful routines in your Level II or Model III Basic ROM

AVAILABLE FOR MODEL 1 & 3

REMASSEM (tape)	\$74.95
REMASSEM (disc)	\$79.95

LEARN TRS-80® ASSEMBLY LANGUAGE DISK I/O

Your disk system and you can really step out with **REMsoft's** Educational Module, **REMODISK-1**, a "short course" revealing the details of DISK I/O PROGRAMMING using assembly language. Intended for the student with experience and assembly language.

COURSE INCLUDES:

- Two 45-minute lessons on audio cassette
- A driver program to make your TRS-80® video monitor serve as a blackboard for the instructor.
- A display program for each lesson to provide illustration and reinforcement for what you are hearing.
- A booklet of comprehensive, fully commented program listings illustrating sequential file I/O, random-access file I/O and track and sector I/O.
- A diskette with machine readable source codes for all programs discussed in both Radio Shack EOTASM and Macro formats.
- Routines to convert from one assembler format to the other.

Presently available for Model 1 only
REMODISK-1 only \$29.95

Dealer Inquiries Invited

These courses were developed and recorded by Joseph E. Willis and are based on the successful series of courses he has taught at Meta Technologies Corporation, the Radio Shack Computer Center, and other locations in Northern Ohio.

 **REMsoft, INC.**
571 E. 185 St.
Euclid, Ohio 44119
(216) 531-1338

SHIPPING CHARGES:
\$2.50 WITHIN UNITED STATES
\$5.00 CANADA AND MEXICO
OTHER FOREIGN ORDERS ADD 20%
OHIO RESIDENTS ADD 6 1/2% SALES TAX

TRS-80® IS A TRADEMARK OF TANDY CORP.

Listing 2 continued

```

01370      LDIR
01380      RET                                ; RETURN TO CALLER
01390      ;
01400      ;        LOADER MESSAGES
01410      ;
01420      LOADDR DEFW   -1                  ; LOWEST ADDRESS LOADED
01430      HIAODR DEFW   0                   ; HIGHEST ADDRESS LOADED
01440      LDMSG  DEFM   'Loading '
01450      LDMSGL EQU    $-LDHSG
01460      LDADDR DEFM   'NNNN'
01470      CSUMER DEFM   'Checksum error near '
01480      CSUMAD DEFM   'NNNN'
01490      CSUMEL EQU    $-CSUMER
01500      LDONE  DEFM   'Load complete: START='
01510      LDSTA  DEFM   'NNNN,END='
01520      LDEND  DEFM   'NNNN,TRA='
01530      LDTRA  DEFM   'NNNN'
01540      LDONEL EQU    $-LDONE
01550      ;
01560      ;        READ 2 HEX DIGITS
01570      ;        CONVERT TO BINARY, RETURN IN A
01580      ;
01590      GETBYT EQU    $
01600      PUSH   DE      ; SAVE REGISTER
01610      CALL   GETDIG  ; GET HIGH DIGIT
01620      SLA   A       ; SHIFT LEFT 4
01630      SLA   A
01640      SLA   A
01650      SLA   A
01660      LD    D,A     ; SAVE HIGH NIBBLE
01670      CALL   GETDIG  ; GET LOW DIGIT
01680      OR    D       ; COMBINE NIBBLES
01690      PUSH   AF      ; SAVE BYTE
01700      ADD   A,C     ; ADD TO CHECKSUM
01710      LD    C,A     ; RESTORE CHECKSUM
01720      POP   AF      ; RESTORE BYTE
01730      POP   DE      ; RESTORE REGISTER
01740      RET
01750      ;
01760      ;        READ 1 HEX DIGIT
01770      ;        CONVERT TO BINARY, RETURN IN A
01780      ;
01790      GETDIG EQU    $
01800      CALL   RSRCV   ; READ A BYTE
01810      JR    C,GETDIG
01820      CALL   CVB      ; CONVERT TO BINARY
01830      JR    C,GETDIG  ; IGNORE IF NOT HEX DIGIT
01840      RET
01850      ;
01860      ;        CONVERT HEX DIGIT IN A TO BINARY
01870      ;        RETURN RESULT IN A, CARRY SET IF ERROR
01880      ;
01890      CVB   EQU    $
01900      SUB   '0'      ; IS IT < '0' ?
01910      JR    C,CVBRET  ; YES - ERROR
01920      ADD   A,'0'-‘G’  ; IS IT > 'F' ?
01930      JR    C,CVBRET  ; YES - ERROR
01940      ADD   A,6      ; IS IT 'A' TO 'F' ?
01950      JP    PC,CVBADJ ; YES - OK
01960      ADD   A,7      ; IS IT '0' TO '9' ?
01970      JR    C,CVBRET  ; NO - ERROR
01980      CVBADJ EQU    $
01990      ADD   A,10    ; MAKE IT BINARY
02000      OR    A       ; INDICATE NO ERROR
02010      CVBRET EQU    $
02020      RET
02030      ;
02040      ;        CONVERT WORD IN HL TO 4 HEX DIGITS
02050      ;        PLACE RESULT (DE)
02060      ;
02070      CVH   EQU    $
02080      LD    C,4      ; DIGIT COUNTER
02090      CVH1  EQU    $
02100      LD    B,4      ; SHIFT COUNTER
02110      CVH2  EQU    $
02120      RL    L       ; SHIFT NEXT DIGIT INTO A
02130      RL    H
02140      RL    A
02150      DJNZ  CVH2
02160      AND   0FH      ; ISOLATE DIGIT
02170      OR    '0'      ; MAKE HEX CHAR
02180      CP    '9'+1    ; IS IT A - F ?
02190      JR    C,NOAPLH
02200      ADD   A,'A'-‘9’-1 ; YES - ADJUST
02210      NOAPLH EQU    $
02220      LD    (DE),A   ; SAVE IN OUTPUT AREA
02230      INC   DE      ; INCREMENT OUTPUT PTR
02240      DEC   C       ; DECREMENT DIGIT COUNT
02250      JR    NZ,CVH1  ; UNTIL DONE
02260      RET
02270      END

```

Program Listing 3

This part of the program contains the RS-232 I/O drivers and receive interrupt handler. Interrupts allow the RS-232 interface to function at a high transmission rate without the possibility of losing characters. The I/O drivers also properly handle XON/XOFF flow control. This form of protocol is very useful in transferring data at high speed. In fact, some computer network interfaces don't function properly without it.

The protocol states that the sending system must stop transmitting immediately upon receipt of the XOFF character ('X'13'), and may resume transmission when it receives an XON signal ('X'11'). In reality, most computers can't stop sending immediately, because it may be impossible to halt characters

"This form of protocol is very useful in transferring data at high speeds. In fact, some computer network interfaces don't function properly without it."

in the process of being sent. For this reason, the receiving system must be prepared to accept some additional data after sending XOFF.

Characters received at the RS-232 interface are read by the interrupt handler RXINT (line 00880) and stored in a 256-byte circular buffer IBUFF (see Program Listing 6). Pointers address the next available spot in the buffer and the oldest character in the buffer (IBUFI and IBUFO). The counter IBUFC contains the current number of characters in the buffer.

When this count approaches an upper limit (240 in this case), FLOOFF at line 01460 is called to halt the incoming flow of data. Because the remote computer supports XON/XOFF flow control, no characters are lost due to the main program's inability to empty the buffer as fast as it is filled. This is particularly useful, if data is received while one of the menus is displayed.

The main program receives and processes characters through calls to

Program Listing 3

```

00100 ;
00110 ; UT3/SRC
00120 ;
00130 ORG 565CH
00140 ;
00150 ; EXTERNALS
00160 ;
00170 BRKTIM EQU 6036H
00180 FLAGS EQU 6033H
00190 IBUFC EQU 607AH
00200 IBUFE EQU 617DH
00210 IBUFF EQU 607DN
00220 IBUFI EQU 6076H
00230 IBUFO EQU 6078N
00240 ;
00250 ; PORT ADDRESSES
00260 ;
00270 RSUART EQU 0EAH ; RS-232 UART CONTROL
00280 TXDONE EQU 40H ; - TRANSMIT BUFFER EMPTY
00290 RSBUFF EQU 0EBH ; RS-232 DATA
00300 ;
00310 ; ROM ROUTINES
00320 ;
00330 DELAY EQU 0060N ; DELAY FOR SPECIFIED TIME
00340 ;
00350 ; ASCII CHARACTERS
00360 ;
00370 PARBIT EQU 00H ; PARITY BIT
00380 XON EQU 11H ; AUX ON (CTRL-Q)
00390 XOFF EQU 13H ; AUX OFF (CTRL-S)
00400 ;
00410 ; FLAG BITS
00420 ;
00430 DUPLEX EQU 0 ; - FULL DUPLEX
00440 ESCKBD EQU 1 ; - <ESC> RECEIVED FROM XBD
00450 ESLIN EQU 2 ; - <ESC> RECV'D FROM REMOTE
00460 XOFFTX EQU 3 ; - <XOFF> SENT TO REMOTE
00470 CRTX EQU 4 ; - <CR> SENT TO REMOTE
00480 XOFFRX EQU 5 ; - <XOFF> RECV'D FROM RMT
00490 ;
00500 ; RS-232 RECEIVE ROUTINE
00510 ; RETURN CHARACTER IN A OR CARRY SET IF NONE
00520 ;
00530 RSRCV EQU $ ; DISABLE INTERRUPTS
00540 DI ;;; SAVE REGISTERS
00550 PUSN HL
00560 PUSN DE
00570 PUSM BC
00580 LD A,(IBUFC). ;;; GET INPUT BUFFER COUNT
00590 OR A ;;; CHECK IF NON-ZERO
00600 JR NZ,GETINP ;;; CONTINUE IF HAVE INPUT
00610 SCF ;;; OTHERWISE INDICATE NONE
00620 JR RSRCVE ;;; EXIT
00630 GETINP EQU $ ;;; DECREMENT INPUT COUNT
00640 DEC A ;;; SAVE NEW COUNT
00650 LD (IBUFC),A ;;; GET BUFFER OUTPUT PTR
00660 LD HL,(IBUFO) ;;; GET NEXT CHARACTER
00670 LD A,(ML) ;;; INCREMENT PTR
00680 INC HL ;;; SAVE NEW PTR
00690 LD (IBUFO),HL ;;; CHECK FOR WRAP
00700 LD DE,IBUFE
00710 OR A
00720 SBC HL,DE
00730 JR NZ,NOOWRP
00740 LD HL,IBUFF ;;; WRAP TO START IF AT END
00750 LD (IBUFO),HL
00760 NOOWRP EQU $ ;;; CLEAR CARRY BIT
00770 OR A
00780 RSRCVE EQU $ ;;; RESTORE REGISTERS
00790 POP BC
00800 POP DE
00810 POP HL
00820 EI ;;; ENABLE INTERRUPTS
00830 CALL FLOOR ;;; RESUME FLOW IF NECESSARY
00840 RET ;;; RETURN TO CALLER
00850 ;
00860 ; RS-232 RECEIVE INTERRUPT HANDLER
00870 ;
00880 RXINT EQU $ ;;; READ CHARACTER
00890 IN A,(RSBUFF) ;;; CLEAR PARITY BIT
00900 AND 255-PARBIT ;;; FLAGS ADDRESS
00910 LD HL,FLAGS ;;; IS IT <XOFF> ?
00920 CP XOFF ;;; NO - CONTINUE
00930 JR NZ,CHKXON ;;; YES - FLOW ALREADY OFF ?
00940 BIT XOFFRX,(ML) ;;; YES - KEEP <XOFF>
00950 JR NZ,RXBUF ;;; NO - INDICATE RECEIVED
00960 SET XOFFRX,(HL)
00970 JR RXINTE ;;; EXIT
00980 CHKXON EQU $ ;;; EXIT

```

Listing 3 continued

RSRCV at line 00530. This routine returns the next character from the input buffer, or, if none is available, sets the Carry flag to indicate that. FLOON at line 01720 resumes input if the number of characters in the input buffer decreases to a safe level.

The routine RSTX (line 01280) outputs characters to the RS-232 interface. It does so only if an XOFF is not received previously from the remote computer, thus maintaining its own flow control support. If the flow halts, RSTX waits until it receives an XON before sending the character and returning.

This section of code shows one of the flaws of this form of flow control. If an XOFF is sent (perhaps inadvertently as data), without being followed by an XON at some later time, the data flow is permanently suspended. This is a significant problem, particularly in computer networks, where large numbers of systems and differing forms of data are involved. One possible solution would be to ignore the XOFF and resume output if no corresponding XON is received within a reasonable amount of time.

The FLOOFF routine turns off remote input by transmitting an XOFF character. This only occurs if XOFF is not already sent with no corresponding XON. A four-character time delay lets the computer receive any characters in transit before returning to the caller.

FLOON is the counterpart of FLOOFF. It allows input to resume by sending an XON to the remote system. This happens only if an XOFF is previously sent to halt input, and if the input buffer contains fewer than 128 characters.

* BOOKKEEPER *
\$34.50
TRS-80 Model III
Perfect for TIME DOME and 90% of other general ledger will run on this program
* SCRIPSIT - MAILER *
\$34.50
Form Letters Envelopes Labels From address list and letter made by SCRIPSIT
* SERVICE BILLING *
\$34.50
Weekly • Bi-Monthly Monthly
- (714) 774-9383 - H. A. K. Workshop ✓287 9791 Orange Ave. Anaheim, Calif. 92804
TRS-80 is a trademark of TANDY

Listing 3 continued

```

00990    CP    XON      ;;; IS IT <XON> ?
01000    JR    NZ,RXIBUF   ;;; NO - CONTINUE
01010    BIT   XOFFRX,(HL) ;;; YES - WAS FLOW OFF ?
01020    JR    Z,RXIBUF    ;;; NO - KEEP <XON>
01030    RES   XOFFRX,(HL) ;;; YES - IND OK TO SEND
01040    JR    RXINTE    ;;; EXIT
01050    RXIBUF EQU    $      ;;; GET INPUT PTR
01060    LD    HL,(IBUFI)  ;;; ADD CHARACTER TO BUFFER
01070    LD    (HL),A      ;;; INCREMENT PTR
01080    INC   HL          ;;; SAVE NEW PTR
01090    LD    (IBUFI),HL  ;;; CHECK FOR WRAP
01100    LD    DE,IBUFE    ;;; WRAP TO START IF AT END
01110    OR    A           ;;; INCREMENT BUFFER COUNT
01120    SBC   HL,DE      ;;; INCREMENT BUFFER COUNT
01130    JR    NZ,NOIWRP   ;;; INCREMENT BUFFER COUNT
01140    LD    HL,IBUFF    ;;; INCREMENT BUFFER COUNT
01150    LD    (IBUFI),HL  ;;; INCREMENT BUFFER COUNT
01160    NOIWRP EQU    $      ;;; INCREMENT BUFFER COUNT
01170    LD    A,(IBUFC)  ;;; INCREMENT BUFFER COUNT
01180    INC   A           ;;; INCREMENT BUFFER COUNT
01190    LD    (IBUFC),A    ;;; INCREMENT BUFFER COUNT
01200    CP    240        ;;; BUFFER NEARLY FULL ?
01210    CALL   Z,FLOOFF   ;;; YES - TURN OFF FLOW
01220    RXINTE EQU    $      ;;; RETURN TO SYSTEM
01230    RET
01240    ;
01250    ;      RS-232 TRANSMIT ROUTINE
01260    ;      SEND CHARACTER IN A TO REMOTE
01270    ;
01280    RSTX  EQU    $      ;;; SAVE REGISTER
01290    PUSH  HL          ;;; FLAGS ADDRESS
01300    LD    HL,FLAGS    ;;; FLAGS ADDRESS
01310    FLOTST EQU    $      ;;; FLOW OFF ?
01320    BIT   XOFFRX,(HL) ;;; YES - WAIT FOR <XON>
01330    JR    NZ,FLOTST   ;;; RESTORE REGISTER
01340    POP   HL          ;;; SAVE CHARACTER
01350    PUSH  AF          ;;; SAVE CHARACTER
01360    TXTST  EQU    $      ;;; WAIT FOR TRANSMITTER READY
01370    IN    A,(RSUART)  ;;; RESTORE CHARACTER
01380    AND   TXDONE     ;;; SEND CHARACTER
01390    JR    Z,TXTST    ;;; RETURN TO CALLER
01400    POP   AF          ;;; RESTORE CHARACTER
01410    OUT   (RSBUFF),A  ;;; SEND CHARACTER
01420    RET
01430    ;
01440    ;      SEND <XOFF> TO HALT RS-232 INPUT
01450    ;
01460    FLOOFF EQU    $      ;;; SAVE REGISTERS
01470    PUSH  AF          ;;; DISABLE INTERRUPTS
01480    PUSH  BC          ;;; <XOFF> ALREADY SENT ?
01490    PUSH  HL
01500    DI
01510    LD    HL,FLAGS    ;;; NO - INDICATE BEING SENT
01520    BIT   XOFFTX,(HL) ;;; ENABLE INTERRUPTS
01530    JR    NZ,FLOOFE   ;;; SEND XOFF
01540    SET   XOFFTX,(HL)
01550    EI
01560    LD    A,XOFF      ;;; DELAY 4 CHARACTER TIMES
01570    CALL  RSTX
01580    LD    HL,(BRKTIM)
01590    ADD   HL,HL
01600    PUSH  HL
01610    POP   BC
01620    CALL  DELAY
01630    FLOOFE EQU    $      ;;; RETURN TO CALLER
01640    EI
01650    POP   HL          ;;; ENABLE INTERRUPTS
01660    POP   BC          ;;; RESTORE REGISTERS
01670    POP   AF
01680    RET
01690    ;
01700    ;      SEND <XON> TO RESUME RS-232 INPUT
01710    ;
01720    FLOON  EQU    $      ;;; SAVE REGISTERS
01730    PUSH  AF          ;;; DISABLE INTERRUPTS
01740    PUSH  HL
01750    DI
01760    LD    HL,FLAGS    ;;; WAS <XOFF> SENT ?
01770    BIT   XOFFTX,(HL)
01780    JR    Z,FLOONE    ;;; NO - DON'T SEND <XON>
01790    LD    A,(IBUFC)    ;;; BUFFER COUNT > 127
01800    CP    12B
01810    JR    NC,FLOONE   ;;; NO - DON'T SEND <XON>
01820    RES   XOFFTX,(HL) ;;; YES - RESET FLAG
01830    EI
01840    LD    A,XON       ;;; ENABLE INTERRUPTS
01850    CALL  RSTX
01860    FLOONE EQU    $      ;;; SEND <XON>
01870    EI
01880    POP   HL          ;;; ENABLE INTERRUPTS
01890    POP   AF          ;;; RESTORE REGISTERS
01900    RET
01910    END

```

AARDVARK L.T.D.

TRS-80 COLOR COMMODORE 64 VIC-20 SINCLAIR/TIMEX TI99/4A



QUEST — A NEW IDEA IN ADVENTURE GAMES! Different from all the others. Quest is played on a computer generated map of Alesia. Your job is to gather men and supplies by combat, bargaining, exploration of ruins and temples and outright banditry. When your force is strong enough, you attack the Citadel of Moorlock in a life or death battle to the finish. Playable in 2 to 5 hours, this one is different every time. TRS-80 Color, and Sinclair, 13K VIC-20. Extended BASIC required for TRS-80 Color and TI99/A. \$14.95 each.

32K TRS 80 COLOR Version \$24.95.
Adds a second level with dungeons and more Questing.



WIZARDS TOWER — This is very similar to Quest (see above). We added wizards, magic, dragons, and dungeons to come up with a Quest with a D&D flavor. It requires 16k extended color BASIC, 13k VIC, Commodore 64, TRS-80 16k Extended BASIC, TI99/A extended BASIC. \$14.95 Tape, \$19.95 Disk.

Authors — Aardvark pays the highest commissions in the industry and gives programs the widest possible advertising coverage. Send a Self Addressed Stamped Envelope for our Authors Information Package.

Send \$1.00 for Complete Catalogue • Please specify system on all orders • \$2.00 Shipping Charge on each order



2352 S. Commerce, Walled Lake, MI 48088 / (313) 669-3110
Phone Orders Accepted 8:00 a.m. to 4:00 p.m. EST. Mon.-Fri.



ZEUS



ZEUS — It's fast and furious as you become the WIZARD fighting off the Thurboots of an angry ZEUS. Your Cone of Cold will destroy a thunderbolt and your shield will protect you — for a while. This is the best and highest speed arcade action we have ever done. Difficulty increases in wave after wave, providing hours of challenging fun and a game that you may never completely master. Commodore 64, Vic20 (16k expander), and 16k TRS-80 Color Computer. (ALL MACHINE CDDE1)
\$19.95 tape \$24.95 disk. (Tape will not transfer to disk.)



ADVENTURES!!

The Adventures below are written in BASIC, are full featured, fast action, full plotted adventures that take 30-50 hours to play. (Adventures are interactive fantasies. It's like reading a book except that you are the main character as you give the computer, commands like "Look in the Coffin" and "Light the torch.")

Adventuring requires 16k on Sinclair, and TRS-80 Color. They require 8k on OSI and 13k on VIC-20. Now available for TI99. Any Commodore 64.

\$14.95 Tape — \$19.95 Disk.

ESCAPE FROM MARS

(by Rodger Olsen)

This ADVENTURE takes place on the RED PLANET. You'll have to explore a Martian city and deal with possibly hostile aliens to survive this one. A good first adventure.

PYRAMID

(by Rodger Olsen)
This is our most challenging ADVENTURE. It is a treasure hunt in a pyramid full of problems. Exciting and tough!



SEAWOLFE — ALL MACHINE CODE In this high speed arcade game, you lay out patterns of torpedoes ahead of the attacking PT boats. Requires Joysticks, at least 13k RAM, and fast reflexes. Lots of Color and Sound. A fun game. Tape or Disk for Vic20, Commodore 64, and TRS-80 Color. NOTE: tape will not transfer to disk!

\$19.95 Tape — \$24.95 Disk.



Dungeons of Death — This is the first D&D type game good enough to qualify at Aardvark. This is serious D&D that allows 1 to 6 players to go on a Dragon Hunting, Monster Killing, Dungeon Exploring Quest. Played on an on-screen map, you get a choice of race and character (Human, Dwarf, Soldier, Wizard, etc.), a chance to grow from game to game, and a 15 page manual. 16k Extended TRS-80 Color, 13k VIC, Commodore 64. At the normal price for an Adventure (\$14.95 tape, \$19.95 disk), this is a give-away.

Dealers — We have a line of about 100 original programs for the machines listed here. We have High speed Arcades, Quality Adventures, Word processors and Business Software for Small machines. Better yet, we have excellent Dealer support. Phone for information.

Program Listing 4

This section of the program contains the various menus and associated routines to select terminal characteristics, start terminal emulation, or terminate the program. (The file transfer menus are contained in Program Listing 5).

Each routine calls MENDSP at line 04760 to display its menu, prompt for a response, and return the value of the response.

MENDSP requires, as parameters, the address of the menu to be displayed, the option number which is to be the default, and the maximum option number that can be selected. It returns to the caller the number of the option selected less one. (This makes it easier for the calling routine to index into a table of values or addresses with the result.) MENDSP displays the menu until a valid response is entered.

LOGON (line 00920) displays the main menu from which other menus are chosen, terminal emulation started, the profile created, or control returned to TRSDOS.

SLBAUD (line 01630) allows selection of the RS-232 baud rate. Eight values are allowed from a possible 16, ranging from 110 to 19,200 baud. When the desired rate is chosen, it is inserted into the main menu for display. The break signal timer value is set at this time, along with the actual data output to the baud rate control port. These values are saved in BRKTIM and RSBAUD (see Listing 6). If you want to alter this menu to allow other baud rates, note that you also have to update the tables at BDTABL, CBDTAB, and BRKTTB.

PAJARO Models I/III 48k

A new programming environment allowing more efficient development of software with user defined statements. Programs easily chained using a built-in bank of variables, making memory seem much larger. Multiple programs in memory. Both integer and 32 place floating point are supported, as well as random and sequential disk files. PAJARO's syntax is much like BASIC's (altho it can be changed if you wish, to spanish, german or whatever you like). Machine language like commands (Block moves and searches) as well as DRAW and SOUND commands. Compiled programs run up to 20 times faster than interpreted BASIC and may be moved to other types of computers (IBM PC, APPLE and CPM run time units available early '84). Models I/III 48k at least 1 drive. Price is \$88.95 post paid in the US. Manual only is \$25.00.

**ULTRA
MAGNETICS**

✓402

Lifetime warranty, SS DD 40 track;
Box of 10 . . . introductory price . . . \$29.95
LOWCOST disks, 6 month warranty SS DD 40 track;
Box of 10 . . . introductory price . . . \$19.95
Add \$2.50 shipping for each disk order. Calif. orders
add 6.5% sales tax. Add \$3 for COD. Send Cashier's
Check or Money Order only to:

RDS, 79 Hill, Watsonville, CA 95076 (408)722-5354

Program Listing 4

```

00100 ; UT4/SRC
00110 ;
00120 ;
00130 ORG 5720H
00140 ;
00150 ; EXTERNALS
00160 ;
00170 BRKTIM EQU 6036H
00180 CHKRMT EQU 5307H
00190 FLAGS EQU 6033H
00200 RSBAUD EQU 6034H
00210 RSTYPE EQU 6035H
00220 SAVPRR EQU 5DCBH
00230 SLFPRM EQU 5BEAH
00240 SPSAVE EQU 607BH
00250 ;
00260 ; PORT ADDRESSES
00270 ;
00280 IMPORT EQU 0E0H ; INTERRUPT MASKS
00290 RXIENB EQU 20H ; - ENABLE RS-232 RX
00300 RTCENB EQU 04H ; - ENABLE RTC INTERRUPTS
00310 RSPORT EQU 0E8H ; RS-232 MASTER RESET
00320 MSTRST EQU 02H ; - MASTER RESET, UART CTL
00330 RSBKG EQU 0E9H ; RS-232 BAUD RATE
00340 B110 EQU 022H
00350 B150 EQU 044H
00360 B300 EQU 055H
00370 B1200 EQU 077H
00380 B2400 EQU 0AAH
00390 B4800 EQU 0CCCH
00400 B9600 EQU 0EEH
00410 B19200 EQU 0FFH
00420 RSUART EQU 0EAH ; RS-232 UART CONTROL
00430 PAREVN EQU 08H ; - EVEN PARITY
00440 SB1 EQU 00H ; - 1 STOP BIT
00450 SB2 EQU 10H ; - 2 STOP BITS
00460 PARDIS EQU 08H ; - PARITY DISABLE
00470 ;
00480 ; ROM ROUTINES
00490 ;
00500 VDCHAR EQU 0033H ; DISPLAY CHAR ON SCREEN
00510 KBWAIT EQU 0049H ; WAIT FOR KEYBOARD INPUT
00520 DELAY EQU 0060H ; DELAY FOR SPECIFIED TIME
00530 INITIO EQU 0069H ; INITIALIZE I/O DRIVERS
00540 VDCLS EQU 01C9H ; CLEAR SCREEN
00550 VDLINE EQU 021BH ; DISPLAY LINE ON SCREEN
00560 ;
00570 ; RAM ADDRESSES
00580 ;
00590 CURSBL EQU 401CH ; CURSOR BLINK (0-BLINK)
00600 CURSCH EQU 4023H ; CURSOR CHARACTER
00610 SYSTEM EQU 402DH ; SYSTEM RETURN JUMP ADDRESS
00620 ;
00630 ; ASCII CHARACTERS
00640 ;
00650 ETX EQU 03H ; END OF TEXT (CTRL-C)
00660 LF EQU 0AH ; LINE-FEED
00670 CR EQU 0DH ; CARRIAGE RETURN (ENTER)
00680 ;
00690 ; SCREEN CHARACTERS
00700 ;
00710 CURSON EQU 0EH ; CURSOR ON
00720 SWPGRF EQU 15H ; SWAP TO GRAPHICS CHARS
00730 CURSHM EQU 1CH ; CURSOR HOME
00740 CLSCRN EQU 1FH ; CLEAR TO END OF SCREEN
00750 CBLOCK EQU 08FH ; CURSOR BLOCK CHARACTER
00760 SPCCOMP EQU 0C0H ; SPACE COMPRESSION CHARS
00770 PTR1 EQU 0F4H ; GRAPHIC HAND POINTER
00780 PTR2 EQU 0F5H
00790 PTR3 EQU 0F6H
00800 ;
00810 ; FLAG BITS
00820 ;
00830 DUPLEX EQU 0 ; - FULL DUPLEX
00840 ESCKBD EQU 1 ; - <ESC> RECEIVED FROM KBD
00850 ESCLIN EQU 2 ; - <ESC> RECV'D FROM REMOTE
00860 XOFFTX EQU 3 ; - <XOFF> SENT TO REMOTE
00870 CRTX EQU 4 ; - <CR> SENT TO REMOTE
00880 XOFFRX EQU 5 ; - <XOFF> RECV'D FROM RMT
00890 ;
00900 ; GET INITIALIZATION PARAMETERS
00910 ;
00920 LOGON EQU $ ; DISP MENU - READ RESPONSE
00930 LD HL,MNMENU ; DEFAULT 6, MAX 9
00940 LD BC,0609H
00950 CALL MENDSP
00960 SLA C ; GET PROCESSOR ADDRESS
00970 LD IX,LGPROC
00980 ADD IX,BC
00990 LD H,(IX+1)

```

Listing 4 continued

Listing 4 continued

```

01000 LD L,(IX+0)
01010 JP (HL) ; GO TO PROCESSOR
01020 ;
01030 ; LOGON MENU PROCESSORS
01040 ;
01050 LGPROC EQU $
01060 DEFW SLBAUD
01070 DEFW SLPRTY
01080 DEFW SLSTPS
01090 DEFW SLDUPL
01100 DEFW SLCURS
01110 DEFW SLSTRT
01120 DEFW SLPFRM
01130 DEFW SAVPRF
01140 DEFW SYSRET
01150 ;
01160 ; MAIN LOGON MENU
01170 ;
01180 MNMENU EQU $
01190 DEFB CURSON
01200 DEFB CURSHM
01210 DEFB CLSCRN
01220 DEFM 'Current values shown in (...)'
01230 DEFB LF
01240 DEFB LF
01250 DEFB SPCOMP+4
01260 DEFM '1 - Set BAUD rate (' '300) '
01270 CBDMSG DEFM LF
01280 DEFB LF
01290 DEFB SPCOMP+4
01300 DEFM '2 - Set parity (' 'EVEN)'
01310 CPMMSG DEFM LF
01320 DEFB SPCOMP+4
01330 DEFM '3 - Set stop bits (' '1)'
01340 DEFM CSTMSG DEFM LF
01350 DEFM SPCOMP+4
01360 DEFB LF
01370 DEFB SPCOMP+4
01380 DEFM '4 - Set duplex (' 'HALF)'
01390 CDMMSG DEFM LF
01400 DEFB SPCOMP+4
01410 DEFM '5 - Set cursor'
01420 DEFB LF
01430 DEFB SWPGRF
01440 DEFB PTR1
01450 DEFB PTR2
01460 DEFB PTR3
01470 DEFB SWPGRF
01480 DEFM '6 - Start terminal emulation'
01490 DEFB LF
01500 DEFB SPCOMP+4
01510 DEFM '7 - Set file transfer parameters'
01520 DEFB LF
01530 DEFB SPCOMP+4
01540 DEFM '8 - Save terminal PROFILE'
01550 DEFB LF
01560 DEFB SPCOMP+4
01570 DEFM '9 - Return to TRSDOS'
01580 DEFB CR
01600 ;
01610 ; DISPLAY BAUD RATE MENU
01620 ;
01630 SLBAUD EQU $
01640 LD HL,BDMENU ; DISP MENU, READ RESPONSE
01650 LD BC,0308H ; DEFAULT 3, MAX 8
01660 CALL MENDSP
01670 LD HL,BDTABL ; SET BAUD RATE
01680 ADD HL,BC
01690 LD A,(HL)
01700 LD (RSBAUD),A
01710 PUSH BC ; INDEX * 6
01720 POP HL
01730 ADD HL,HL ; - * 2
01740 ADD HL,BC ; - * 3
01750 ADD HL,HL ; - * 6
01760 PUSH HL
01770 SLA C ; INDEX * 2
01780 LD HL,BRKTBT ; SET BREAK TIMER
01790 ADD HL,BC
01800 LD DE,BRKTIM
01810 LD BC,2
01820 LD DIR
01830 POP BC
01840 LD HL,CBDTAB ; INSERT IN OPTIONS MSG
01850 ADD HL,BC
01860 LD DE,CBDMSG
01870 LD BC,6
01880 LD DIR
01890 JP LOGON ; RETURN TO MAIN MENU
01900 ;

```

Listing 4 continued

SLPRTY (line 02570) changes the terminal parity to even, odd, or none. Even parity is the default. The program enters the new parity into the main menu for display and also includes it in the variable RSTYPE.

SLSTPS (line 03130) chooses the number of stop bits to be used. Normally, 1 stop bit is sufficient; 2 stop bits are used mainly in conjunction with 110 baud. As with baud and parity, the new setting is saved for display in the main menu and in RSTYPE.

SLCURS (line 03560) changes from half-duplex operation to full-duplex and vice versa. In half-duplex mode, characters entered at the keyboard display immediately on the screen. No display occurs with full-duplex. The new value is saved in the main menu, and the Duplex flag in Flags reflects the new setting.

SLDUPL (line 03990) allows the use of one of four different cursors. The cursor can be either an underscore or a block, blinking or nonblinking. The system locations CURSCH and CURSBL set the cursor type.

SLSTRT (line 04480) is called when you select the default option from the main menu. The RS-232 interface is reinitialized to reflect any changes in baud rate, parity, or stop bits. RS-232 receiver interrupts are enabled, the screen is cleared, and terminal emulation mode is entered.

SYSRET (line 04620) returns control to TRSDOS. RS-232 interrupts are disabled to prevent spurious interrupts after the program is terminated, I/O drivers are restored by a call to INITIO, and control returns to the system.

Continued on p. 252

* FOR APARTMENT BUILDING OWNERS *

APARTMENT BUILDING MANAGEMENT SYSTEM

Computerize your management functions for up to 30 apartment buildings. Performs all necessary accounting for all owner and tenant transactions.

Transactions include: Rent Pmts, Late Chrgs, Mort Pmts, Utility Pmts, Taxes, Insurance, Capital Expenditures, 40 User Categories (Income & Expenses) and much more.

Produces many reports: Audit Trail, Late Rents, Percent Rtn on Inv, G/L Full Due, Income, Expenses, Taxes, Investments, Rcvd Rents, Late Chrgs, Deductables, Utilities, Insurance, Percent Occupancy, Profit/Loss Stmt, User Cat's, Vacant Units and more.

Runs on TRS-80 Model I & III 32K. Supports Hard Disk Drive operation. => Send for FREE Description and Sample Printouts. => Also available is FREE 1983 Software Catalog with complimentary Phone Directory Program.

-448-

COST ONLY \$79.95
COLEMAN COMPUTER SERVICES
 P.O. BOX 588 ST. ALBANS, N.Y. 11412

```

01910 ; BAUD RATE MENU
01920 ; $DISP MENU
01930 BDMENU EQU CURSHN
01940 DEFB CLSCRN
01950 DEFN 'BAUD rate selection:'
01960 LP
01970 DEFB
01980 DEFB LP
01990 DEFB LF
02000 SPCOMP+4
02010 '1 - 110'
02020 DEFB LF
02030 SPCOMP+4
02040 '2 - 150'
02050 DEFB LF
02060 DEPB SWPGRF
02070 DEFB PTR1
02080 DEFB PTR2
02090 DEFB PTR3
02100 DEFB SWPGRF
02110 DEFN '3 - 300'
02120 DEFB SPCOMP+4
02130 DEFB '4 - 1200'
02140 DEFN LF
02150 DEFB SPCOMP+4
02160 DEFN '5 - 2400'
02170 DEFB LP
02180 DEFB SPCOMP+4
02190 DEFN '6 - 4000'
02200 DEFB LP
02210 DEFB SPCOMP+4
02220 DEFN LP
02230 DEFB '7 - 9600'
02240 DEFB LF
02250 DEFB SPCOMP+4
02260 DEFN '8 - 19200'
02270 DEFB CR
02280 ; BAUD RATE SETTING TABLE
02290 ; $BDTABL
02310 BDTABL EQU B110
02320 DEFB B150
02330 DEFN B300
02340 DEFB B1200
02350 DEFN B2400
02360 DEFN B4000
02370 DEFN B9600
02380 DEFB B19200
02390 DEFN '110) 150) 3000) 12000) 19200)
02400 CBDDTAB DEFN (4000) 9600) 19200)
02410 DEFN '2400) 4000) 9600) 19200)
02420 ; BREAK TIMER TABLE
02430 ;
02440 ; $DISP MENU, READ RESPONSE
02450 BRKTTB EQU 3333H
02460 DEFW 2222H
02470 DEFW B111H
02480 DEFW 0444H
02490 DEFW 0222H
02500 DEFW 0111H
02510 DEFW 0099H
02520 DEFW 0044H
02530 DEFW 21920 SEC.

02550 ; DISPLAY PARITY MENU
02560 ;
02570 SLPRTY EQU HL_PRMENU
02580 LD BC_0103H ; DISP MENU, READ RESPONSE
02590 LD CALL MENISP ; DEFAULT 1, MAX 3
02600 LD HL_PRTABL ; GET PARITY SETTING
02610 ADD HL_BC
02620 ADD A,(RSTYPE)
02630 LD 255-PAREVN-PARDIS ; SET NEW PARITY
02640 AND (HL)
02650 OR (RSTYPE),A ; INDEX * 4
02660 PUSH BC
02670 PUSH HL
02680 POP HL
02690 ADD HL_HL
02700 ADD HL_HL
02710 PUSH HL
02720 POP BC
02730 LD HL_CPTAB ; INSERT IN OPTIONS MSG
02740 ADD HL_BC
02750 LD DE_CPNMSG
02760 LD BC_4
02770 LDIR JP LOGON ; RETURN TO MAIN MENU
02780 ; PARITY MENU
02790 DEFB 02100 ; PRMENU
02800 DEFB 02030
02810 DEFB 02040
02820 DEFB 02050
02830 DEFB 02060
02840 DEFB 02070
02850 DEFB 02080
02860 DEFB 02090
02870 DEFB 02100
02880 DEFB 02110
02890 DEFB 02120
02900 DEFB 02130
02910 DEFB 02140
02920 DEFB 02150
02930 DEFB 02160
02940 DEFB 02170
02950 DEFB 02180
02960 DEFB 02190
02970 DEFB 02200
02980 DEFB 02210
02990 DEFB 02220
03000 DEFB 02230
03010 DEFB 02240
03020 DEFB 02250
03030 DEFB 02260
03040 DEFB 02270
03050 DEFB 02280
03060 DEFB 02290
03070 DEFB 02300
03080 DEFB 02310
03090 DEFB 02320
03100 DEFB 02330
03110 DEFB 02340
03120 DEFB 02350
03130 DEFB 02360
03140 DEFB 02370
03150 DEFB 02380
03160 DEFB 02390
03170 DEFB 02400
03180 DEFB 02410
03190 DEFB 02420
03200 DEFB 02430
03210 DEFB 02440
03220 DEFB 02450
03230 DEFB 02460
03240 DEFB 02470
03250 DEFB 02480
03260 DEFB 02490
03270 DEFB 02500
03280 DEFB 02510
03290 DEFB 02520
03300 DEFB 02530
03310 CPTAB ; DISPLAY STOP BITS MENU
03320 SLSTS EQU HL_SBMENU ; DISP MENU, READ RESPONSE
03330 LD BC_0102H ; DEFAULT 1, MAX 2
03340 LD BC_0102H ; NO PARITY (DISABLED)
03350 DEFB 0 EVEN ODDNONE' ; 1 - EVEN PARITY
03360 DEFB 1 ; 2 - ODD PARITY
03370 DEFB 2 ; 3 - NO PARITY (DISABLED)
03380 DEFB 3

```

```

03160 CALL MENDSP ; GET STOP BIT SETTING
03170 LD HL,SPTRTAB ; CLEAR OLD SETTING
03180 ADD HL,BC ; SET NEW ONE
03190 LD A,(RSTTYPE) ; SET NEW ONE
03200 AND 255-SB2 ; Terminal duplex selection:
03210 OR (HL)
03220 LD (RSTTYPE),A ; CONVERT TO CHARACTER
03230 LD A,C ; MSG
03240 ADD A,'1' ; INSERT IN OPTIONS MSG
03250 LD (CSTMMSG),A ; RETURN TO MAIN MENU
03260 JP LOGON
03270 ; STOP BIT MENU
03280 ; STOP BIT MENU
03290 ; STOP BIT MENU
03300 SBMENU EQU $ ; SBMENU
03310 DEFB CURSHM ; CURSHM
03320 DEFB CLSCRN ; CLSCRN
03330 DEFM 'Stop bit selection:' ; Stop bit selection:
03340 DEFB LF ; LF
03350 DEFB LF ; LF
03360 DEFB SWPGRF ; SWPGRF
03370 DEFB PTR1 ; PTR1
03380 DEFB PTR2 ; PTR2
03390 DEFB PTR3 ; PTR3
03400 DEFB SWPGRF ; SWPGRF
03410 DEFM '1 - 1 stop bit' ; 1 - 1 stop bit'
03420 DEFB LF ; LF
03430 DEFB SPCOMP+4 ; SPCOMP+4
03440 DEFB '2 - 2 stop bits' ; 2 - 2 stop bits'
03450 DEFM CR ; CR
03460 DEFB SBI ; SBI
03470 DEFB SB2 ; SB2
03480 ; STOP BIT SETTING TABLE
03490 ; DISPLAY HALF/FULL DUPLEX MENU
03500 SPRTAB EQU $ ; SPRTAB
03510 DEFB SBI ; SBI
03520 DEFB SB2 ; SB2
03530 ; DISPLAY HALF/FULL DUPLEX MENU
03540 ; DISPLAY HALF/FULL DUPLEX MENU
03550 ; DISPLAY HALF/FULL DUPLEX MENU
03560 SLDUPL EQU $ ; DISPLAY HALF/FULL DUPLEX MENU
03570 LD HL,DPMENU ; DISPLAY HALF DUPLEX
03580 LD BC,$102H ; DEFAULT 1, MAX 2
03590 CALL MENDSP ; MAKE FULL IF SO
03600 LD A,(FLAGS) ; ASSUME HALF DUPLEX
03610 RES DUPLEX,A ; CLEAR CURRENT DUPLEX
03620 OR C ; MAKE NEW SETTING
03630 LD (FLAGS),A ; MAKE FULL IF SO
03640 LD A,C ; MAKE FULL IF SO
03650 LD HL,CDHALF ; CURSOR type selection:
03660 OR A ; CURSOR type selection:
03670 JR Z,MOVDUP ; MOVEUP
03680 LD HL,CDFULL ; MOVEUP
03690 MOVDUP EQU $ ; MOVEUP
03700 LD DE,CDMSG ; MOVEUP
03710 LD BC,4 ; MOVEUP
03720 LDIR LOGON ; MOVEUP
03730 JP LOGON ; MOVEUP
03740 ; RETURN TO MAIN MENU
03750 ; DUPLEX MENU
03760 DPMENU EQU $ ; DUPLEX MENU
03770 DEFB DPMENU ; CURSHM
03780 DEFB CLSCRN ; CLSCRN
03790 DEFM 'Terminal duplex selection:' ; Terminal duplex selection:
03800 DEFB LF ; LF
03810 DEFB LF ; LF
03820 DEFB SWPGRF ; SWPGRF
03830 DEFB PTR1 ; PTR1
03840 DEFB PTR2 ; PTR2
03850 DEFB PTR3 ; PTR3
03860 DEFB SWPGRF ; SWPGRF
03870 DEFM '1 - Half-duplex' ; 1 - Half-duplex'
03880 DEFB LF ; LF
03890 DEFB SPCOMP+4 ; SPCOMP+4
03900 DEFM '2 - Full-duplex' ; 2 - Full-duplex'
03910 ; DISPLAY CURSOR MENU
03920 DEFB CR ; CR
03930 DEFB CDHALF ; CDHALF
03940 DEFB DEFM 'HALF' ; HALF
03950 DEFB CDFULL ; FULL
03960 ; DISPLAY CURSOR MENU
03970 ; DISPLAY CURSOR MENU
03980 ; DISPLAY CURSOR MENU
03990 SLCURS EQU $ ; SLCURS
04000 LD HL,CRMENU ; CRMENU
04010 LD BC,$0304H ; BC,$0304H
04020 CALL MENDSP ; MENDSP
04030 LD A,C ; A,C
04040 LD B,CBLOCK ; CBLOCK
04050 BIT 0,A ; 0,A
04060 LD NZ,NOUNDS ; NZ,NOUNDS
04070 LD B,- ; B,-
04080 NOUNDS EQU $ ; NOUNDS
04090 PUSH BC ; BC
04100 POP CP ; CP
04110 JR C,NOBLNK ; NOBLNK
04120 LD B,B ; B,B
04130 NOBLNK EQU $ ; NOBLNK
04140 LD A,B ; A,B
04150 LD (CUREBL),A ; (CUREBL),A
04160 POP AF ; AF
04170 LD (CURECH),A ; (CURECH),A
04180 JP LOGON ; LOGON
04190 ; CURSOR TYPE MENU
04200 ; CURSOR TYPE MENU
04210 ; CURSOR TYPE MENU
04220 CRMENU EQU $ ; CRMENU
04230 DEFB CURSHM ; CURSHM
04240 DEFB CLSCRN ; CLSCRN
04250 DEFM 'Cursor type selection:' ; Cursor type selection:
04260 DEFB LF ; LF
04270 DEFB LF ; LF
04280 DEFB SPCOMP+4 ; SPCOMP+4
04290 DEFM '1 - Underscore' ; 1 - Underscore'
04300 DEFB LF ; LF
04310 DEFB SPCOMP+4 ; SPCOMP+4
04320 DEFB PTR1 ; PTR1
04330 DEFM '2 - Block' ; 2 - Block'

```

```

04640 OUT (IMPORT),A ; RESTORE I/O DRIVERS
04650 CALL INITIO ; ; RESTORE STACK POINTER
04660 LD SP,(SPSAVE) ; ; CLEAR SCREEN
04670 CALL VDCLS ; ; RETURN TO SYSTEM
04680 JP SYSTEM

04690 ; DISPLAY MENU
04700 ; (HL) = MENU MESSAGE
04710 ; B = DEFAULT VALUE
04720 ; C = MAX VALUE
04730 ; RETURNS VALUE-1 IN BC
04740 ;
04750 ;
04760 NENDSP EQU $ ; SAVE MENU ADDRESS
04770 PUSH HL ; DISPLAY MENU
04780 CALL VDLINE ; DISPLAY ENTER MESSAGE
04790 LD HL,ENTERM
04800 CALL VDLINE
04810 CALL KBWAIT
04820 CALL VDCHAR
04830 CP CR
04840 JR NZ,NODEFL
04850 LD C,B ; YES - USE DEFAULT
04860 DEC C ; MAKE RELATIVE TO 0
04870 JR MENRET ; RETURN
04880 NODEFL EQU $ ; WAIT FOR RESPONSE
04890 SUB L1 ; ECHO
04900 JR C,MENERR ; <ENTER> ?
04910 CP C ; LESS THAN '1' ?
04920 JR NC,MENERR ; YES - ERROR
04930 LD C,A ; TOO HIGH ?
04940 JR MENRET ; NO - GET RETURN VALUE
04950 MENERR EQU $ ; EXIT
04960 PUSH BC ; SAVE PARMs
04970 LD HL,LOGEMS ; DISPLAY ERROR MESSAGE
04980 CALL VDLINE ; ; DISPLAY ERROR MESSAGE
04990 LD BC,0 ; ; DISPLAY ABOUT 2 SEC.
05000 CALL DELAY
05010 LD BC,0 ; ; RESTORE PARMs
05020 CALL DELAY
05030 POP BC ; ; RESTORE MENU ADDRESS
05040 POP HL ; ; RETRY
05050 JR MENDSP ; ; RETRY
05060 MENRET EQU $ ; ; CLEAN UP STACK
05070 LD B,0 ; ; RETURN TO CALLER
05080 POP HL ; ; RETURN TO CALLER
05090 RET ; ; RETURN TO CALLER

05100 ; MENU DISPLAY INPUT PROMPT
05110 ;
05120 ; EQU $ ; ; CLEAN UP STACK
05130 ENTERM EQU $ ; ; RETURN TO SYSTEM
05140 DEFB LF ; ; INVALID OPTION SELECTED
05150 DEFM L ; ; TYPE A NUMBER TO SELECT AN OPTION
05160 DEFM '0' ; ; OR <ENTER> FOR DEFAULT
05170 DEFB SWPGRF ; ; RESTORE MENU ADDRESS
05180 DEFB PTR1 ; ; RESTORE PARMs
05190 DEFB PTR2 ; ; RESTORE MENU ADDRESS
05200 DEFB PTR3 ; ; RESTORE PARMs
05210 DEFB SWPGRF ; ; RESTORE MENU ADDRESS
05220 DEFM '-' ; ; RESTORE PARMs
05230 DEFB ETX ; ; RESTORE MENU ADDRESS
05240 LOGEMS DEFB LF ; ; RESTORE PARMs
05250 DEFM CR ; ; RESTORE MENU ADDRESS
05260 DEFB END ; ; RESTORE PARMs
05270 DEFB END ; ; RESTORE MENU ADDRESS

```

Baudy House Computer Products

15 Scott Lake Road • Pontiac, Michigan 48341
(313) 423-3399

SUPER UTILITY PLUS VERSION 3.0 \$59.95

Model 1 and 3 Software

Killer Gorilla.....	\$15.95/\$19.95
Jungle Boy.....	\$15.95/\$19.95
Killer Beetles.....	\$15.95/\$19.95
Strike Force.....	\$15.95/\$19.95
Subterranean Encounter	
Tape.....	\$22.95 Disk.....\$24.95

Communications

Modem 80.....	\$39.95
DFT II.....	\$24.95
Color DFT.....	\$19.95
Lynx Modems.....	\$225.00
Hayes 3/12.....	\$549.95
Hayes 300.....	\$249.95

Miscellaneous

NewDOS 80.....	\$119.95
DosPlus.....	\$119.95
Multidos.....	\$85.00
C. Itoh Prowriter (par).....	\$375.00
Epson FX-80 (par).....	\$549.95
Mx-80 ribbons.....	\$7.95
	only.....\$29.95

Most orders are shipped out in 24 hours. Visa & Mastercard, Money Orders, Checks, C.O.D. accepted. Please allow 10 days to clear on all checks. Write or call today! Add \$3.00 shipping & handling. Orders going out of U.S.A. please add \$5.00. Prices are subject to change without notice. Cash prices shown for items over \$20.00.

Color Computer Software

Color Caterpillar.....	\$19.95
Death Trap.....	\$19.95
Subhunt.....	\$19.95
Shark Treasure.....	\$19.95
Frogger, (great).....	\$24.95
Donkey King.....	\$24.95
Gave Hunter.....	\$24.95
Dragon Quest.....	\$19.95
Doodle Bug.....	\$24.95
Galaxy AttaXX.....	\$21.95

Color Hardware

Amdek III-B drives.....	\$549.00
Atari Joystick adaptor.....	\$17.95
C. Itoh Prowriter (ser).....	\$495.95

Miscellaneous

Micro Pak Printer Paper	
540 sheets only.....	\$10.00

this is 20 pound laser cut or buy in full 3,000 sheet only.....\$29.95

Listing 4 continued

```

04340 DEFB LF ; ; RESTORE RS-232
04350 DEFB SWPGRF ; ; RESTORE STACK POINTER
04360 DEFB PTR1 ; ; CLEAR SCREEN
04370 DEFB PTR2 ; ; RETURN TO SYSTEM
04380 DEFB PTR3 ; ; RESTORE MENU ADDRESS
04390 DEFB PTR4 ; ; RESTORE PARMs
04400 DEFM '3' ; ; RESTORE MENU ADDRESS
04410 DEFB PTR5 ; ; RESTORE PARMs
04420 DEFB PTR6 ; ; RESTORE MENU ADDRESS
04430 DEFB PTR7 ; ; RESTORE PARMs
04440 DEFB PTR8 ; ; RESTORE MENU ADDRESS
04450 DEFB PTR9 ; ; RESTORE PARMs
04460 ; START UP TERMINAL EMULATOR
04470 ; ; RESTORE RS-232
04480 SLSTRT EQU $ ; ; RESTORE MENU ADDRESS
04490 LD A,MSTRET ; ; RESTORE RS-232
04500 OUT (RSPORT),A ; ; RESTORE STACK POINTER
04510 LD A,(RSBAUD) ; ; SET BAUD RATE
04520 OUT (RSBRG),A ; ; RESTORE MENU ADDRESS
04530 LD A,(RSPTYPE) ; ; SET UART CONTROL
04540 OUT LD A,RXINRB+RTCENB ; ; ENABLE RX INTERRUPTS
04550 OUT (IMPORT),A ; ; RESTORE PARMs
04560 OUT (IMPO) ,A ; ; RESTORE MENU ADDRESS
04570 CALL VDCLS ; ; RESTORE PARMs
04580 CALL CHKRTMT ; ; RESTORE MENU ADDRESS
04590 JP ; ; RESTORE RS-232
04600 ; RETURN TO SYSTEM
04610 ; ; RESTORE RS-232
04620 SYSRET EQU $ ; ; RESTORE MENU ADDRESS
04630 LD A,RTCENB ; ; RESTORE PARMs

```

WILL YOU
**DONATE \$250
TO TANDY CORPORATION?**



TRS-80 MODEL 4

*That's Exactly What You Will Do If You Buy Your TRS-80 Model 4
From A Company Owned Radio Shack Store!*

We sell the TRS-80 Model 4, 64K, RS-232, for \$1749. Radio
Shack sells it for \$1995. If you don't need the RS-232 interface,
you save \$100. If you would like 128K RAM, add only \$50.

This Month's Software Special
Good Thru 9-30-83

LDOS 5.1 — \$99
For the TRS-80 Model III

**READ THIS PART AND
SAVE
ANOTHER COUPLE HUNDRED DOLLARS**

It's a known fact that Computer Manufacturers sell their computers at a low margin and make up the difference on peripheral items. One of these items is Computer Memory.

If you would like 128K Memory instead of 64K, you pay Radio Shack \$149. If you order it from us at the time you get your Model 4, it costs only \$50. Save a quick \$100! If you need a printer with your computer, see the following page and save \$100 to \$300 over what you would pay Radio Shack for an equivalent printer!



918/825-4844

AMERICAN SMALL
BUSINESS COMPUTERS

118 SO. MILL ST.
PRYOR, OK 74351
(918) 825-4844

NEED INFO QUICK?

Then just call our 24-hour TOLL FREE telephone number. Leave your name, address, and phone number. Messages will be handled 24 hours a day. Only requests for product information will be processed. All other calls will be directed by our customer service.

Call 1-800-331-3844

In Oklahoma Call
1-918-825-4844 ✓ 217

Program Listing 5

```

00100 ;
00110 ; UT5/SRC
00120 ;
00130     ORG      5BEAH
00140 ;
00150 ; EXTERNALS
00160 ;
00170 CDBMSG EQU    5780H
00180 CDMSG  EQU    57C6H
00190 CHKRMT EQU    5307H
00200 CPMSG  EQU    5798H
00210 CSTHSG EQU    57B2H
00220 CVB   EQU    562BH
00230 DCB   EQU    6044H
00240 FILBUF EQU    617DH
00250 FLAGS  EQU    6033H
00260 FLOOFF EQU    56E2H
00270 FLOOR  EQU    5703H
00280 HPROMP EQU    6042H
00290 HSTEOP  EQU    6043H
00300 HSTEOR  EQU    6041H
00310 HSTSTF  EQU    6040H
00320 LOGON  EQU    5720H
00330 MENDSP  EQU    5B53H
00340 RSRCV  EQU    565CH
00350 RSTX   EQU    56CEH
00360 TRMPT  EQU    6033H
00370 ;
00380 ; ROM ROUTINES
00390 ;
00400 VDCHAR  EQU    0033H      ; DISPLAY CHAR ON SCREEN
00410 KBLINE   EQU    0040H      ; READ LINE FROM KEYBOARD
00420 DELAY    EQU    0060H      ; DELAY FOR SPECIFIED TIME
00430 VDCLS   EQU    01C9H      ; CLEAR SCREEN
00440 VDLINE   EQU    021BH      ; DISPLAY LINE ON SCREEN
00450 KBBRK   EQU    028DH      ; FAST KBD SCAN FOR BREAK
00460 ;
00470 ; RAM ROUTINES
00480 ;
00490 ERRDSP  EQU    4409H      ; DISPLAY DOS ERROR MSG
00500 MSGDSP  EQU    0C0H       ; - DSP MESSAGE, NO DOS RET
00510 ERRBFN  EQU    13H        ; - INVALID FILENAME
00520 ERREOF  EQU    1CH        ; - END-OF-FILE
00530 ERRNRF  EQU    1DH        ; - NO-RECORD-FOUND
00540 SYNTAX  EQU    441CH      ; SYNTAX CHECK FILENAME
00550 INIT    EQU    4420H      ; INIT OCB, OPEN DISK FILE
00560 OPEN    EQU    4424H      ; OPEN DISK FILE
00570 CLOSE   EQU    4428H      ; CLOSE DISK FILE
00580 READ    EQU    4436H      ; READ DISK FILE RECORD
00590 WRITE   EQU    4439H      ; WRITE DISK FILE RECORD
00600 ;
00610 ; RAM ADDRESSES
00620 ;
00630 VIDRAM  EQU    3C00H      ; VIDEO RAM
00640 CAPSLK  EQU    4019H      ; CAPS LOCK (0=UPLOW)
00650 CURSBL  EQU    401CH      ; CURSOR BLINK (0=BLINK)
00660 CURSCH  EQU    4023H      ; CURSOR CHARACTER
00670 ;
00680 ; ASCII CHARACTERS
00690 ;
00700 PARBIT  EQU    00H        ; PARITY BIT
00710 ETX    EQU    03H        ; END OF TEXT (CTRL-C)
00720 TAB    EQU    09H        ; TAB
00730 LF     EQU    0AH        ; LINE-FEED
00740 FF     EQU    0CH        ; FORM-FEED (CTRL-L)
00750 CR     EQU    0DH        ; CARRIAGE RETURN (ENTER)
00760 XON    EQU    11H        ; AUX ON (CTRL-Q)
00770 XOFF   EQU    13H        ; AUX OFF (CTRL-S)
00780 DEL    EQU    7FH        ; DEL
00790 ;
00800 ; SCREEN CHARACTERS
00810 ;
00820 CURSON EQU    0EH        ; CURSOR ON
00830 SWPGRP  EQU    15M       ; SWAP TO GRAPHICS CMARS
00840 CURSHM  EQU    1CN        ; CURSOR HOME
00850 CLSCRN  EQU    1FH        ; CLEAR TO END OF SCREEN
00860 SPCOMP  EQU    0C0H      ; SPACE COMPRESSION CHARS
00870 PTR1   EQU    0F4H      ; GRAPHIC HAND POINTER
00880 PTR2   EQU    0F5H
00890 PTR3   EQU    0F6H
00900 ;
00910 ; FLAG BITS
00920 ;
00930 DUPLEX EQU    0          ; - FULL DUPLEX
00940 ESCKBD  EQU    1          ; - <ESC> RECEIVED FROM KBD
00950 ESCLIN  EQU    2          ; - <ESC> REVC'D FROM REMOTE
00960 XOFFTX  EQU    3          ; - <XOFF> SENT TO REMOTE
00970 CRTX   EQU    4          ; - <CR> SENT TO REMOTE
00980 XOFFRX  EQU    5          ; - <XOFF> RECV'D FROM RMT
00990 ;
01000 ; PROFILE FILE RECORD FORMAT

```

Continued from p. 247

Program Listing 5

This part of the program deals with disk file transfers and with the creation of the Profile/TRM file.

SFLPRM (line 01160) alters the values of various special characters used in the file transfer routines. It functions in the same manner as the menu routines in Listing 4. The program calls one of four routines to read and save the new value of a special character. The default option returns to the main menu. Although each of these routines allows input of characters in the range X'00' to X'FF', the file transfer system deals with characters from which the parity bit (bit 7) has been removed. Therefore, characters in the range X'80' to X'FF' are not recognized.

FPSTFC (line 01850) changes the start-of-file character. This character signifies the beginning of a file received from a remote computer. Data

"Most computers use some form of prompt to signify that they are able to accept input..."

received before the start-of-file character is ignored.

FPEOFC (line 02090) chooses the end-of-file character, used to signify the end of a file from the remote system.

FPEORC (line 01930) selects the end-of-record character. This character marks the end of a logical record of data in a file being received.

FPPRCH (line 02010) selects the remote computer's prompt character. Most computers use some form of prompt to signify that they are able to accept input; in fact, most large mainframe systems require that input not begin until this character is sent.

Each of these four routines calls GETHEX to prompt for and read the two hexadecimal digits representing the character.

SAVPRF at line 02770 appears after you select option 8 from the main menu. It creates a record of the current terminal characteristics: duplex, baud rate, parity, stop bits, tab stops, cursor type, and the four special file transfer

Listing 5 continued

WE STOCK THESE PRINTERS!

OKIDATA

B2A	\$419.95
B3A	\$699.95
84	\$549.95
92	\$929.95
93	\$1049.95



Smith
Corona
TP-1
\$549.95

STOP

RIGHT NOW!

Call our Toll Free "Quick Information"
Hotline for Epson Printer Prices.
We'll send you any info you need
on any of our products.



STAR
MICRONICS

Gemini 10X \$319.95
Gemini 15 \$499.95

EPSON

MX-80 FT	MX-100
FX-80	FX-100
RX-80	

Our Epson Prices are So Low,
We Can't Even Print Them!



918/825-4844

118 SO. MILL ST.
PRYOR, OK 74361
(918) 825-4844

SMALL
BUSINESS
COMPUTERS

NEED INFO QUICK?

Please call our automated TOLL FREE answering machine. Leave your name, address, and phone number. Requests will be checked for updates the same day. Daily requests for product information will be processed; all others will be disregarded by our answering service.

CALL 1-800-331-3096

In Oklahoma City
1-918-825-4844

characters, and writes this record to the file Profile/TRM. This destroys any previously saved profile.

Routines FILERX and FILETX complete file transfer. The mechanism for initiating a file transfer is simple. The remote system command to start the file transfer is entered from the keyboard as usual, without its terminating CR. It is assumed that the input-termination character is the CR. Then simultaneously press the escape and < keys to send a file or the escape and > keys to receive a file, followed by the TRSDOS file name, followed by CR. The escape-key sequence and the file name are not sent to the remote computer, but are used to open a TRSDOS file.

As soon as it receives the escape-key sequence, the program does a shift lock, so that the file name input is in uppercase, and calls READFN (line 05630) to read the file name. This input is accomplished using the system routine

"The remote system command to start the file transfer is entered from the keyboard as usual, without its terminating CR."

KBLINE, so all the usual TRS-80 input-editing characters may be used. For example, assuming that the command "type file name" lists a file at the terminal, the following transfers the remote file "myfile" to the TRSDOS file Myfile/TXT:

type myfile [ESC] > MYFILE/TXT [CR]

Frequently, an editor is used to receive a file from the TRS-80. For example:

edit myfile [CR]
input [ESC] < MYFILE/TXT [CR]

causes the TRSDOS file Myfile/TXT to be input to the remote file myfile. The Input command causes the editor to enter input mode.

Receiving a File

To receive a file, FILERX (line 03370) opens the TRSDOS file, sends off the terminating CR and waits for the start-of-file character. When this char-

Listing 5 continued

```

01010 ;
01020 PRFOPT EQU   0          ; TERMINAL OPTIONS
01030 PRFBO  EQU   PRFOPT+17  ; 'BAUD'
01040 PRFPAR EQU   PRFDUP+6  ; 'PARITY'
01050 PRFDUP EQU   PRFPAR+4  ; 'DUPLEX'
01060 PRFSTP EQU   PRFDUP+4  ; 'STOP BITS'
01070 PRPCCH EQU   PRFSTP+1  ; CURSOR CHARACTER
01080 PRFCBL EQU   PRPCCH+1  ; CURSOR BLINK
01090 PRFSTF EQU   PRFCBL+1  ; 'START-OF-FILE'
01100 PRFEOR EQU   PRFSTF+2  ; 'END-OF-RECORD'
01110 PRFPRM EQU   PRFEOR+2  ; 'PROMPT'
01120 PRFEOP EQU   PRFPRM+2  ; 'END-OF-FILE'
01130 ;
01140 ;      SELECT FILE TRANSFER PARMS
01150 ;
01160 SLFPRM EQU   $          ; DISP MENU - READ RESPONSE
01170 LD     HL,FPMENU
01180 LD     BC,0505H ; DEFAULT 5, MAX 5
01190 CALL  HENDSP
01200 SLA   C          ; COMPUTE PROCESSOR ADDRESS
01210 LD     IX,FPPROC
01220 ADD   IX,BC
01230 LD     H,(IX+1)
01240 LD     L,(IX+0)
01250 JP     (HL)       ; GO TO PROCESSOR
01260 ;
01270 ;      FILE PARM PROCESSOR ADDRESSES
01280 ;
01290 FPPRDC EQU   $          ; FILE PARM PROCESSOR ADDRESSES
01300 DEFW  FPSTFC
01310 DEFW  FPEORC
01320 DEFW  FPPRCH
01330 DEFW  FPEOFC
01340 DEFW  LOGON
01350 ;
01360 ;      FILE PARMETER MENU
01370 ;
01380 FPMENU EQU   $          ; FILE PARMETER MENU
01390 DEFB  CURSON
01400 DEFB  CURSHM
01410 DEFB  CLSCRN
01420 DEFM  'File transfer parameter selection:'
01430 DEFB  LF
01440 DEFM  'Current values shown in (...)'
01450 DEFB  LF
01460 DEFB  LF
01470 DEFB  SPCOMP+4
01480 DEFM  '1 - Set start-of-file character (X'
01490 DEFB  ''
01500 FPHSTF DEFM  '02'
01510 DEFB  ''
01520 DEFB  ')'
01530 DEFB  LF
01540 DEFB  SPCOMP+4
01550 DEFM  '2 - Set end-of-record character (X'
01560 DEFB  ''
01570 FPHEOR DEFM  '0D'
01580 DEFB  ''
01590 DEFB  ')'
01600 DEFB  LF
01610 DEFB  SPCOMP+4
01620 DEFM  '3 - Set prompt character (X'
01630 DEFB  ''
01640 FPHPRM DEFM  '11'
01650 DEFB  ''
01660 DEFB  ')'
01670 DEFB  LF
01680 DEFB  SPCOMP+4
01690 DEFM  '4 - Set end-of-file character (X'
01700 DEFB  ''
01710 FPHEOF DEFM  '03'
01720 DEFB  ''
01730 DEFB  ')'
01740 DEFB  LF
01750 DEFB  SWPGRF
01760 DEFB  PTR1
01770 DEFB  PTR2
01780 DEFB  PTR3
01790 DEFB  SWPGRF
01800 DEFM  '5 - Return to main menu'
01810 OEOF  CR
01820 ;
01830 ;      SET START-OF-FILE CHARACTER
01840 ;
01050 FPSTFC EQU   $          ; SET START-OF-FILE CHARACTER
01060 LD     HL,FPHSTF
01070 LD     DE,HSTSTF
01080 CALL  GETHEX
01090 JP     SLFPRM
01100 ;

```

Listing 5 continued

HEY! JOE COMPUTER INC.! BEAT THESE DISK DRIVE PRICES!

(It's impossible — and you darn well know it!)

TEAC "Slimline" — *1/2 the width of a regular minifloppy disk drive*

40 Track, Single Sided
40 Track, Double Sided
80 Track, Double Sided

	<i>1 Drive with Power Supply & Cabinet</i>	<i>2 Drives in One Cabinet</i>	<i>Bare Drive</i>
40 Track, Single Sided	\$219.95	\$399.95	\$179.95
40 Track, Double Sided	\$249.95	\$459.95	\$209.95
80 Track, Double Sided	\$299.95	\$559.95	\$259.95



NOW...BEAT THIS WARRANTY

1 YEAR

Our minifloppy disk drives will work on TRS-80 Models 1, 3, and 4, the IBM Personal Computer and the Radio Shack Color Computer. All drives for the Model 1, and the 3rd & 4th drive for the Models 3 & 4 require a power supply & cabinet and drive cable (\$29.95). The second drive for Models 3 & 4 is a bare drive. The first 2 drives for the IBM PC are bare drives; the 3rd and 4th drives require power supplies & cabinets. Color Computer disk drives require power supplies and cabinets. In addition, the 1st drive on a color computer requires a ROM pack & cable (\$169.95). The second drive for a Model III requires a power cable (\$10). If you have had your 1st drive on a Model 4 installed since you bought the Model 4, the second drive requires a power cable (\$10).

Drive O Kit for the Model 3

\$399

*Complete with drive &
complete installation instructions*

TANDON Minifloppy Disk Drives

40 Track, Single Sided
40 Track, Double Sided
80 Track, Single Sided
80 Track, Double Sided

Drive with Power Supply & Cabinet

Bare Drive

\$239.95
\$319.95
\$329.95
\$369.95

\$189.95
\$269.95
\$279.95
\$319.95



918/825-4844

118 SO. MILL ST.
PRYOR, OK 74361
(918) 825-4844

**SMALL
BUSINESS
COMPUTERS**

NEED INFO QUICK?

Then just call our automated information
answering machine. Leave your name, address,
and phone number. Record will be sent
via *1st Class* the same day. Only requests
for *product information* will be answered.
All others will be disregarded. No one
answering, please.

Call 1-800-331-3898

or Oklahoma City
405-319-925-4844

```

01910 ;      SET END-OF-RECORD CHARACTER
01920 ;
01930 FPEORC EQU    $ 
01940 LD     HL,FPHEOR
01950 LD     DE,HSTEOF
01960 CALL   GETHEX
01970 JP     SLFPRM
01980 ;
01990 ;      SET PROMPT CHARACTER
02000 ;
02010 FPFRCH EQU    $ 
02020 LD     HL,FPHPRM
02030 LD     DE,HPROMP
02040 CALL   GETHEX
02050 JP     SLFPRM
02060 ;
02070 ;      SET END-OF-FILE CHARACTER
02080 ;
02090 FPEOFC EQU    $ 
02100 LD     HL,FPHEOF
02110 LD     DE,HSTEOF
02120 CALL   GETHEX
02130 JP     SLFPRM
02140 ;
02150 ;      READ 2 HEX CHARS FROM KEYBOARD
02160 ;      SAVE CHAR (HL), SAVE BINARY (DE)
02170 ;
02180 GETHEX EQU    $ 
02190 PUSH   HL          ; SAVE REGISTERS
02200 PUSH   DE
02210 CALL   VDCLS        ; CLEAR SCREEN
02220 HXPRMP EQU    $ 
02230 LD     HL,HEXMSG    ; PROMPT FOR INPUT
02240 CALL   VDLINE
02250 LD     A,1          ; SHIFT LOCK
02260 LD     (CAPSLK),A
02270 LD     HL,FILBUF    ; READ RESPONSE
02280 LD     B,2
02290 CALL   KBLINE
02300 XOR    A            ; SHIFT UNLOCK
02310 LD     (CAPSLK),A
02320 LD     DE,FILBUF    ; CONVERT 1ST CHAR TO BINARY
02330 LD     A,(DE)
02340 LD     B,A
02350 CALL   CVB
02360 JR     C,GHXERR    ; EXIT IF ERROR
02370 SLA   A            ; SHIFT LEFT 4
02380 SLA   A
02390 SLA   A
02400 SLA   A
02410 LD     H,A          ; SAVE HIGH DIGIT
02420 INC   DE
02430 LD     A,(DE)        ; GET 2ND DIGIT
02440 LD     C,A
02450 CALL   CVB
02460 JR     C,GHXERR    ; EXIT IF ERROR
02470 OR    H            ; COMBINE DIGITS
02480 POP   DE
02490 LO    (DE),A        ; SAVE BINARY (DE)
02500 POP   HL
02510 LD     (HL),B
02520 INC   HL
02530 LD     (HL),C
02540 RET
02550 GHXERR EQU    $ 
02560 LO    HL,HEXERR    ; DISPLAY ERROR MESSAGE
02570 CALL   VDLINE
02580 JR     HXPRMP      ; TRY AGAIN
02590 ;
02600 ;      GETHEX MESSAGES
02610 ;
02620 HEXMSG EQU    $ 
02630 DEFB   CURSON
02640 DEFM   'Enter character as 2 hexadecimal digits '
02650 DEFB   SWPGRF
02660 DEFB   PTR1
02670 DEFB   PTR2
02680 DEFB   PTR3
02690 DEFB   SWPGRF
02700 DEPM   '
02710 DEFB   ETX
02720 HEXERR DEFM   'Invalid hexadecimal input'
02730 DEFB   CR
02740 ;
02750 ;      SAVE TERMINAL PROFILE
02760 ;
02770 SAVPRF EQU    $ 
02780 LD     DE,FILBUF    ; POINT TO DISK FILE BUFFER
02790 LD     HL,TRMOPT    ; INSERT TERMINAL OPTIONS

```

acter is received, the data following is saved for disk output in a 256-byte buffer FILBUF. When the buffer is full, it is written to disk with a call to DSKOP. All control characters except Tab and FF are discarded. Each character received that matches the end-of-record character is translated to CR, and added to the buffer. This cycle continues until the end-of-file character is received, or until you press the break key at which time the file closes and normal terminal operations resume.

Sending a File

Like FILERX, FILETX at line 04260 reads the TRSDOS file name and opens the file, which must exist. Each disk record is read into FILBUF. Before each logical record of data is sent, the remote prompt character must be received. A logical record is a block of data termi-

*"Once the file is sent,
control returns to normal
terminal operations."*

nated by CR. Once the prompt character is received, data is transmitted up to and including the next CR. This process continues until either end-of-file is encountered, or the break key is pressed on the keyboard.

Because many of the editors used to receive such a file treat a logical record consisting of a single CR as the signal to exit from input mode, a blank ('20') is inserted between any consecutive CRs found in the file. Once the file is sent, control returns to normal terminal operations. At this point you must exit from input mode in the editor and issue whatever command is necessary to save your new file on the remote system.

Disk Operations

Because most TRS-80 disk I/O operations disable interrupts for a considerable length of time, it is necessary to guard against the possibility of losing data received during such operations. Therefore, the routine DSKOP (line 05490) performs all disk I/O. The address of the TRSDOS I/O routine is passed as a parameter.

Prior to performing the operation, FLOOFF is called to halt the incoming flow of data from the remote. Then the I/O operation is done, and FLOON is called to resume the flow of data, if necessary. It is essential that the remote sys-

M-ZAL

Release Two Is Here!

Our Users asked for it, and we made the best TRS-80 disk assembler even better! Now M-ZAL has:

- Recursive MACROS with full symbolic parameter substitution
- Conditional assembly with unlimited nesting
- Text Editor warm-start/recovery option
- Support for all popular source file formats
- Load Module inspect/superzap using LINKER
- and the features that made it famous:**
- True multi-pass assembly
- Full Screen Option Menus
- ENTRY/EXTERN symbols, relocation, and object module linking
- 8 character labels with sorted symbol table
- Built-in symbol table cross-reference
- Nested *INCLUDES (source file chaining/nesting)
- Lower case support (Model 3 only)
- Over 175 pages of documentation including Z-80 Technical Manual
- Full Screen Text Editing and much, much more!

M-ZAL provides a modular, structured development environment that makes programming your TRS-80 a truly enjoyable experience. Order yours today. (Requires 32k, 2 disk system)

#1050-10	Mod 1	\$149.00
*#1250-10	Mod 3	\$149.00

CAU Development Software— The Professionals Choice:

Full Screen Text Editor for BASIC: we were the first to give the TRS-80 this indispensable ability! A must for every BASIC programmer:

| #1210-20	Mod 1 & 3	\$29.95
----------	-----------	---------

T-ZAL: custom designed for the Model 3, this tape based assembler has many of M-ZAL's most desired features.

*#1250-20	Mod 3 only	\$49.95
-----------	------------	---------

XBUG: for machine language analysis and debugging—this tiny (2.5k) but powerful program lets you do it all!

*#1020-10	Mod 1	\$19.95
*#1220-10	Mod 3	\$19.95

FILEXFER: transfer any disk file between two TRS-80s. Use direct cable link or RS modems. Mod 1 and Mod 3 can be mixed. RS-232 and disk reqd.

*#1040-10	Mod 1 and 3	\$49.95
-----------	-------------	---------

"We've been using M-ZAL heavily for over two months now, and it's been worth its weight in gold."

—Chuck Tesler
PROSOFT

"...well written software that is long overdue."

—Bruce Douglass
80 Microcomputing
BASIC Editor Review

"During the first 3 days of use, M-ZAL saved more money in programmers time than we had paid for the product."

—William Denman
Author of Asylum
MED SYSTEMS

"The editor has at least doubled my productive capacity...Having spent a good deal of money on so called 'utilities' that don't work, it's a delight to find one that not only lives up to its claims but surpasses the advertising."

—BASIC Editor user

Our choice for the best TRS-80 DOS:

DOSPLUS 3.4	Mod 1	\$149.00
DOSPLUS 3.4	Mod 3	\$149.00

Call or write for more information.

All products require level II.

Mail orders specify catalog #.

Send check, money order, or MC/VISA numbers and expiration date to:

Computer Applications Unlimited

P.O. Box 214, Dept. ABM Rye, New York 10580
(800) 354-5400 (toll free, orders only)
(914) 937-6286 (questions & NY state residents)

N.Y./State residents add applicable sales tax.
Outside USA and Canada add \$10.00 shipping.
Dealer Inquiries Invited.



COMPUTER APPLICATIONS UNLIMITED™
a div. of CAU, Inc.

TRS-80 is a TM of Tandy Corp. M-ZAL is a TM of CAU, Inc.
Z-80 is a TM of Zilog, Inc.

```

02000 LD BC,17 ; OPEN FILE
02010 LDIR BL,CBDMSG ; INSERT 'BAUD'
02020 LD BC,6 ; SAVE ERROR CODE
02030 LD BL,CMSG ; SEND <CR>
02040 LDIR LD,A,CR ; RESTORE ERROR CODE
02050 LD BC,4 ; IF ERROR ...
02060 LD BL,CMSG Z,WTSTF ; DISPLAY ERROR MESSAGE
02070 LDIR CALL ERRMSG ; EXIT TO MAINLINE
02080 LD BC,4 CRKRT ; EXIT TO MAINLINE
02090 LDIR LD,WTSTF ; WAIT FOR HOST START-OF-FILE
02090 LD A,(CSTMSG) ; INSERT 'STOP BITS'
02090 LD (FILEBUF+PRPSTF),A ; FILEBUF+PRFSTF ,A ; WAIT FOR START-OF-FILE
02090 LD A,(CURSCH) ; INSERT CURSOR CHARACTER
02090 LD (FILEBUF+PRFCR),A ; FILEBUF+PRFCR ,A ; EXIT IF <BREAK>
02090 LD A,(CURSBL) ; INSERT CURSOR BLINK
02090 LD (FILEBUF+PREBL),A ; FILEBUF+PREBL ,A ; READ CHARACTER
02090 LD BL,(PRSTF) ; INSERT 'START-OF-FILE'
02090 LD (FILEBUF+PRFSTF),HL ; FILEBUF+PRFSTF ,HL ; START-OF-FILE ?
02090 LD (FILEBUF+PRFCR),HL ; FILEBUF+PRFCR ,HL ; NO - READ NEXT CHARACTER
02090 LD (FILEBUF+PRFFOR),HL ; FILEBUF+PRFFOR ,HL ; READ DATA FROM REMOTE , CREATE DISK FILE
02090 LD (FILEBUF+PRFPRM),HL ; FILEBUF+PRFPRM ,HL ; FILEBUF+PRFPRM ,HL ; FILE BUFFER COUNT
02090 LD (FILEBUF+PRFEOF),HL ; FILEBUF+PRFEOF ,HL ; POINT TO FILE BUFFER
02090 LD B,0 ; EXIT IF <BREAK>
02090 LD DE,DCB NZ,FILEOF ; READ A BYTE FROM LINE
02090 LD BC,TPRFFL CALL RSRVC ; END-OF-FILE CHARACTER ?
02090 LD HL,FILBUF DE,(BSTEOP) ; END-OF-FILE CHARACTER ? ; END-OF-FILE CHARACTER ? ; END-OF-RECORD CHARACTER ?
02090 LD B,0 NZ,CKXCTL ; YES - MAKE IT <CR>
02090 LD DE,DCB NZ,FBUFB ; IGNORE <DEL>
02090 LD BC,TPRFFL CALL RSRVC ; REEP <TAB>
02090 LD HL,FILBUF NZ,FILEOF ; IGNORE CONTROL CHARS
02090 LD B,0 NZ,ERRMSG ; ADD CHAR TO FILE BUFFER
02090 LD DE,DCB INC HL ; INCREMENT BUFFER PTR
02090 LD BC,TPRFFL CALL RSRVC ; DISPLAY CHARACTER
02090 LD HL,FILBUF DJNZ RDBYTE ; UNTIL BUFFER FULL
02090 LD B,0 CALL DSKOP ; WRITE DISK RECORD
02090 LD DE,DCB Z,RDREC ; IF ERROR ...
02090 LD BC,TPRFFL CALL ERRMSG ; DISPLAY ERROR MESSAGE
02090 LD B,0 FCLOSE ; CLOSE FILE
02090 LD DE,DCB END-OF-FILE SIGNALLED ; FILENAME
02090 LD BC,TPRFFN DEFN PROFILE/TRM' ; PROFILE FILENAME
02090 LD DEFB CR ; EXIT IF ERROR
02090 LD BC,TPRFFL EQU $-TPRFFN ; OPEN FILE
02090 LD BC,TPRFFN ; RECEIVE FILE FROM REMOTE
02090 LD BC,TPRFFN PROFILE/NAME' ; PROFILE FILENAME
02090 LD BC,TPRFFN DEFB CR ; GET DISK FILENAME
02090 LD BC,TPRFFN CALL NC,CHKRT ; EXIT IF ERROR
02090 LD BC,TPRFFN CALL HL,FILBUF ; OPEN FILE
02090 LD BC,TPRFFN B,0 ; LRL = 0

```

Subscribe to 80 Micro for one year and get our 1983 Special Anniversary Issue absolutely **FREE!**

You'll receive 12 months of **80 Micro**, the magazine packed with programs and projects for Radio Shack's personal, business, and portable computers. **80 Micro** gives you:

- user-application programs—written by readers like you who need programs to maximize the productivity of their machines.
- new-product reviews—information you need to make the right buying decisions.
- debugging techniques—**80 Micro** saves time with expert solutions to common and irregular problems.
- hardware modifications—upgrade your computer and become more familiar with its functions while you save money and increase its value.

Subscribe today.

And don't forget, with your subscription, **80 Micro** gives you a free, 1983 Anniversary Issue. This bonus thirteenth issue, published in January of 1983, is loaded with over 70 new articles on games, tutorials, utilities, programming techniques, plus Bill Barden's Assembly-Language Primer, 3-D Stereoscopic programs, a complete **80 Micro** annotated index, and more.



Yes! Send me a year's subscription
to **80 Micro** at \$35.97.

I understand that upon receipt of payment, I will receive **80 Micro's** 1983 Special Anniversary Issue absolutely FREE!

Check/mo MC Amex Visa Bill me

SIGNATURE _____ EXP. DATE _____

CARD # _____

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Canada and Mexico \$44.97, 1 year only. US funds drawn on US bank. Foreign Surface \$54.97, 1 year only. US funds drawn on US bank. Please allow 6-8 weeks for delivery.

Send coupon with payment to

80 micro

P.O. Box 981
Farmingdale, NY 11737

339P8

```

04070    JR      2,FCLOSE          ; NO - CLOSE FILE
04080    NEG    (DCB+5),A          ; YES - COMP LEN REMAINING
04090    LD      IX,WRITE          ; SET RECORD DELIM OFFSET
04100    CALL   DSKOP             ; WRITE LAST RECORD
04110    CALL   NZ,ERRMSG          ; DISP ERROR MESSAGE IF ANY
04120    LD      HL,(DCB+12)        ; DECREMENT ERN
04130    LD      HL,FILEXD          ; DISPLAY DONE MESSAGE
04140    DEC    DE               ; DECREMENT ERN
04150    LD      (DCB+12),HL
04160    EQU    $                 ; EXIT IF <BREAK>
04170    LD      IX,CLOSE          ; CLOSE FILE
04180    CALL   DSKOP             ; READ CHARACTER
04190    CALL   NZ,ERRMSG          ; PROMPT ?
04200    LD      HL,FILEXD          ; NO - READ NEXT CHARACTER
04210    CALL   VDLINE             ; RESTORE BUFFER PTR
04220    JP      CHKRMT           ; EXIT TO MAINLINE
04230    ; SEND FILE TO REMOTE
04240    ; FILETX EQU    $                 ; GET NEXT BYTE
04250    ; FILETX EQU    LD      HL,FTXIND          ; CLEAR PARITY BIT
04260    ; FILETX EQU    LD      HL,FTXIND          ; INCREMENT BUFFER PTR
04270    ; FILETX EQU    LD      HL,FTXIND          ; IS IT <CR> ?
04280    ; FILETX EQU    CALL   READFN             ; YES - END-OF-RECORD
04290    ; FILETX EQU    CALL   NC,CHKRMT          ; IS IT <TAB> ?
04300    ; FILETX EQU    JP      NC,CHKRMT          ; YES - OK
04310    ; FILETX EQU    LD      HL,FLAGS            ; IS IT <FF> ?
04320    ; FILETX EQU    SET    CRTX,(ML)
04330    ; FILETX EQU    LD      HL,FILBUF            ; OPEN FILE
04340    ; FILETX EQU    LD      B,@                ; LRL=0
04350    ; FILETX EQU    IX,OPEN             ; RESTX A
04360    ; FILETX EQU    CALL   DSKOP             ; RESTX A,(FLAGS)
04370    ; FILETX EQU    PUSH   AF               ; RESTORE ERROR CODE
04380    ; FILETX EQU    LD      A,CR              ; RESTX A,(FLAGS)
04390    ; FILETX EQU    CALL   RSTX              ; RESTX A
04400    ; FILETX EQU    POP    AF               ; RESTORE ERROR CODE
04410    ; FILETX EQU    JR      2,GETREC          ; IF ERROR ***
04420    ; FILETX EQU    CALL   NZ,ERRMSG          ; DISPLAY ERROR MESSAGE
04430    ; FILETX EQU    JP      CHKRMT           ; EXIT TO MAINLINE
04440    ; FILETX EQU    READ   NEXT DISK FILE RECORD
04450    ; FILETX EQU    LD      HL,FILBUF            ; READ DISK RECORD
04460    ; FILETX EQU    LD      B,@                ; POINT TO FLAG BYTE
04470    ; FILETX EQU    GETREC          ; READ BUFFER PTR
04480    ; FILETX EQU    LD      B,@                ; WAS <CR> LAST CHAR SENT ?
04490    ; FILETX EQU    LD      IX,READ             ; NO - CONTINUE
04500    ; FILETX EQU    CALL   DSKOP             ; YES - INSERT A BLANK
04510    ; FILETX EQU    JR      2,GETREC          ; BUFFER NOT EMPTY, WAIT
04520    ; FILETX EQU    LD      EREOF             ; OTHERWISE READ NEXT RECORD
04530    ; FILETX EQU    CP      2,FTXEOF          ; END-OF-FILE REACHED
04540    ; FILETX EQU    JR      ERNREN             ; INDICATE SENDING <CR>
04550    ; FILETX EQU    CALL   NZ,ERRMSG          ; RESTORE BUFFER PTR
04560    ; FILETX EQU    JR      FTXEOF             ; SEND <CR>
04570    ; FILETX EQU    LD      HL,(DCB+10)        ; CURRENT RECORD *
04580    ; FILETX EQU    GOTREC          ; NEXT RECORD *
04590    ; FILETX EQU    LD      DE,(DCB+12)        ; LAST RECORD *
04600    ; FILETX EQU    DEC    DE               ; IS THIS THE LAST RECORD ?
04610    ; FILETX EQU    LD      HL,DE              ; NO - CONTINUE
04620    ; FILETX EQU    OR     A                 ; YES - GET BYTE COUNT
04630    ; FILETX EQU    SBC    HL,DE              ; CLOSE FILE
04640    ; FILETX EQU    LD      NZ,HAVREC          ; CALL CALL
04650    ; FILETX EQU    JR      A,(DCB+0)          ; DISP ERROR MESSAGE IF ANY
04660    ; FILETX EQU    LD      B,A
04670    ; FILETX EQU    LD      NZ,ERRMSG          ; CLOSE DISK
04680    ; FILETX EQU    LD      B,A

```

**"AUTHOR
AUTHOR!"**

The call for authors is out!

Wayne Green Books announces an October 1, 1983 deadline for submitting manuscript proposals for the upcoming publication list. Ideas for book-length manuscripts about any microcomputer system or area of electronics will be considered. In addition to payment and royalties, we offer our distribution channels and the marketing support your book deserves.

Send proposals or requests for a copy of our Writer's Guide to:

Editor, **Wayne Green Books**
Peterborough, NH 03458.
Or call toll-free **1-800-343-0722**.

pbh frees your computer for other operations while our "**BASIC BUFFER**" manages your printer. **BASIC BUFFER** offers **64K** with **FIFO COPY** and **ERASE**. It comes complete with power supply and cables for most computers and printers. (Specify manufacturer and model number of both when ordering.)

A real value at **ONLY \$279.95 + shipping**.

ATTENTION, CoCo OWNERS

Stop changing Printer & Modem Cables! Our **PARALLEL PRINTER INTERFACE** provides **SWITCH SELECTABLE PRINTER** or **MODEM** operations. It features switchable baud rates from 300 to 9600; comes complete with power supply, modem cable & "**CENTRONICS**" type printer cable.

Introductory Price **ONLY \$74.95 + shipping**.

pbh computer products, inc.

P.O. DRAWER 55868
HOUSTON, TEXAS 77055
(713) 956-0207

✓20

ORDER DIRECT FROM US OR FROM YOUR INDEPENDENT COMPUTER RETAIL STORE.

For more information circle reader card number 20.



TRUE Relational Database Management for TRS - 80 Mod I/III

ENB is a true relational database manager. Your data is held in ordered sets. You impose structure by creating and linking sets in various ways. Prompt screens are automatically generated from this underlying structure. You define reports ordered by any set, showing directly or indirectly linked sets (and enforce a host of further conditions on the selected set members).

What's more, ENB has an integrated data dictionary; structural info is carried in the database as data, just like everything else. This lets you restructure your database at will, without reblocking or reprogramming, using the regular editing commands. Also, exchange files containing structured data with other ENB databases. Special reports on database structure are built in and (like all reports) are always current.

64K data items, spans 4 disk drives (or hard disk). Interfaces to BASIC, file exchange with Scriptit, VisiCalc and other ENB data bases. Includes 5 action tutorials, 150 page manual.

Developed in England by Southern Software.

You Owe It To Your Data!

\$140 \$3 Shipping
CA add 6%

TRS-80 SCRIPPSITTM Radio Shack, VISICALCTM Visicorp.

✓136

Allen Gelder Software
Allen Gelder Software

Box 11721 San Francisco, CA 94101 (415) 681-9371

```

05310 LD HL,FILEXD ; DISPLAY DONE MESSAGE
05320 CALL VDLINE
05330 JP CHKRMT ; EXIT TO MAINLINE
05340 ; FILE TRANSFER UTILITIES MESSAGES
05350 ; FILE TRANSFER UTILITIES MESSAGES
05360 ; FILE TRANSFER UTILITIES MESSAGES
05370 ; FILE TRANSFER UTILITIES MESSAGES
05380 ; FILE TRANSFER UTILITIES MESSAGES
05390 ; FILE TRANSFER UTILITIES MESSAGES
05400 ; FILE TRANSFER UTILITIES MESSAGES
05410 ; FILE TRANSFER UTILITIES MESSAGES
05420 ; FILE TRANSFER UTILITIES MESSAGES
05430 ; FILE TRANSFER UTILITIES MESSAGES
05440 ; FILE TRANSFER UTILITIES MESSAGES
05450 ; TURN OFF REMOTE, PERFORM DISK OPERATION
05460 ; (IX) = DISK ROUTINE
05470 ; DSKOP EQU $ ; TURN OFF REMOTE
05480 ; DSKOP CALL FLOOFF ; PUSH RETURN ADDRESS
05490 ; DSKOP EQU $ ; GET DCB ADDRESS
05500 ; DSKOP CALL DE,DSKOPR ; 'CALL' DISK ROUTINE
05510 ; DSKOP CALL DE,DSKOPR ; TURN REMOTE BACK ON
05520 ; DSKOP CALL DE,DCB ; RETURN TO CALLER
05530 ; DSKOP CALL DE,DCB ; RETURN TO CALLER
05540 ; DSKOP CALL DE,DCB ; RETURN TO CALLER
05550 ; DSKOP CALL DE,DCB ; RETURN TO CALLER
05560 ; DSKOP CALL DE,DCB ; RETURN TO CALLER
05570 ; DSKOP CALL DE,DCB ; RETURN TO CALLER
05580 ; DSKOP CALL DE,DCB ; RETURN TO CALLER
05590 ; READ FILENAME FROM KEYBOARD
05600 ; VALIDATE, MOVE TO DCB
05610 ; RETURNS (DE) = DCB, CARRY CLEAR IF ERROR
05620 ; READFN EQU $ ; SHIFT LOCK
05630 ; READFN LD A,1 ; READ FILENAME
05640 ; READFN LD (CAPSLK),A ; READ FILENAME
05650 ; READFN LD B,23 ; READ FILENAME
05660 ; READFN LD HL,FILBUF ; KBLINE
05670 ; READFN CALL KBLINE ; TURN CURSOR BACK ON !
05680 ; READFN LD A,CURSON ; SHIFT UNLOCK
05690 ; READFN CALL VDCHAR ; SHIFT UNLOCK
05700 ; READFN CALL XOR ; SHIFT UNLOCK
05710 ; READFN LD (CAPSLK),A ; VALIDATE, MOVE TO DCB
05720 ; READFN LD DE,DCB ; SYNTAX
05730 ; READFN CALL SCF ; INDICATE NO ERROR
05740 ; READFN JR 2, FNAMOK ; IF ERROR
05750 ; READFN LD A,ERRBN ; DISPLAY ERROR MESSAGE
05760 ; READFN CALL ERRMSG ; SEND <CR> TO HOST
05770 ; READFN CALL A,CR ; INDICATE ERROR
05780 ; READFN CALL RSTX ; RETURN TO CALLER
05790 ; READFN OR A ; RETURN TO CALLER
05800 ; READFN OR $ ; RETURN TO CALLER
05810 ; READFN EQU RET ; RETURN TO CALLER
05820 ; READFN EQU RET ; RETURN TO CALLER
05830 ; READFN EQU RET ; RETURN TO CALLER
05840 ; READFN EQU RET ; RETURN TO CALLER
05850 ; READFN EQU RET ; RETURN TO CALLER
05860 ; READFN EQU RET ; RETURN TO CALLER
05870 ; READFN EQU RET ; RETURN TO CALLER
05880 ; READFN EQU RET ; RETURN TO CALLER
05890 ; READFN EQU RET ; RETURN TO CALLER
05900 ; READFN EQU RET ; RETURN TO CALLER
05910 ; READFN EQU RET ; RETURN TO CALLER

```

CONVERT YOUR SERIAL PRINTER TO PARALLEL CONVERT YOUR PARALLEL PRINTER TO SERIAL

The UPI serial printer interfaces allow an ASCII serial printer to be connected to the parallel printer port of the TRS-80 computers or any other computer which has a Centronics compatible parallel printer port.

Software compatibility problems which normally result when a serial printer is used are totally eliminated because, the computer "thinks" that a parallel printer has been connected. Special driver programs and changes to the operating system are not required with computers designed to work with a parallel printer.

The UPI interfaces are completely self contained and ready to use. A D825 socket mates with the cable from your serial printer. The ribbon cable attaches to the parallel printer port of your computer. The UPI interfaces convert the output of your parallel printer port into serial data in both the RS232-C and 20 ma. loop formats. Switch selectable features include:

- Linefeed after Carriage Return
- Handshake polarity (RS232-C)
- Nulls after Carriage Return
- 7 or 8 Data Bits per word
- 1 or 2 Stop Bits per word
- Odd, Even, or, No Parity
- 8 baud rates 110 to 9600

UPI-3V8 for TRS-80 I & III	\$149.95
UPI-2VB for TRS-80 II & 16	\$149.95
UPI-3VB-6 for TRS-80 I & III with 6 ft. cable	\$159.95
UPI-2VB-6 for TRS-80 II & 16 with 6 ft. cable	\$159.95
Models for most other computers available at	\$159.95

NEW SERIAL TO PARALLEL INTERFACES

The SPC SERIAL to PARALLEL interfaces convert serial ASCII data into parallel format for use with Centronics type parallel printers. A DB25 socket accepts serial data from your parallel printer. The 36 contact ribbon connector plugs into your parallel printer. Can be used to add a second parallel printer port to computers which reliably support both serial and parallel printers.

Switch selectable options include the following:

- 7 or 8 Data Bits per serial word
- Odd or Even parity for serial word
- Parity or No parity for serial word
- 1 or 2 Stop Bits per serial word
- 300, 600, 1200, 2400, or 4800 BAUD

SPC-1 as described above	\$89.95
SPC-CC with DIN plug and cable for the TRS-80 Color Computer	\$69.95

All prices U.S. funds. VISA, MASTER CARD, COD, Purchase Orders accepted from schools, major corporations, and government agencies. Shipping and Handling on U.S. orders \$4.00. Ten day return period. Ninety day warranty.



BINARY DEVICES
11560 TIMBERLAKE LANE
NOBLESVILLE, IN 46060
(317) 842-5020

>106

TRS-80 is a trademark of TANDY

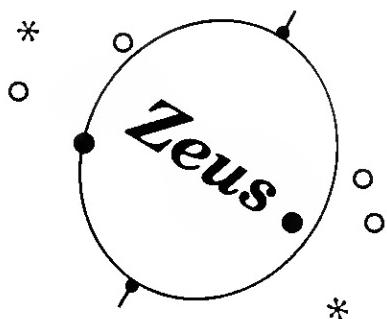
CEC Introduces

Z E U S

Editor Assembler

- Works "as is" with DOSPLUS, MULTIDOS, NEWDOS/80, and Model III TRSDOS.
- Saves and loads source text in three formats.
- Creates object code from diskette source files as well as RAM.
- Leaves the user with over 34,000 bytes for source kit.

*"We think it is the **MOST** powerful Editor Assembler in the Universe!"*



Introductory Price

Only \$7995

Which includes an operating system that will BOOT and run in Model I, III & 4!

Add \$3.00 shipping/handling (foreign orders add \$15.00). Michigan residents add 4% sales tax COD add \$1.50. Model I orders specify single, double or P density. Personal checks take two weeks to clear. VISA & MasterCard accepted.

Cosmopolitan Electronics Corporation

5700 PLYMOUTH ROAD
ANN ARBOR, MICHIGAN 48105

Technical Line: (313) 668-6660

Toll-Free Orders: 800-392-3785

Program Listing 6

```

00100 ;
00110 ;      UT6/SRC
00120 ;
00130     ORG    6025H
00140 ;
00150 ;      PORT ADDRESSES
00160 ;
00170 RSBRG  EQU    0E9H           ; RS-232 BAUD RATE PORT
00180 B110   EQU    022H
00190 B150   EQU    044H
00200 B300   EQU    055H
00210 B1200  EQU    077H
00220 B2400  EQU    0AAH
00230 B4000  EQU    0CCH
00240 B9600  EQU    0EEH
00250 B19200 EQU    0FFH
00260 RSUART EQU    0EAH           ; RS-232 UART CONTROL PORT
00270 PAREVN EQU    00H           ; - EVEN PARITY
00280 WD7    EQU    20H           ; - 7-BIT WORDS
00290 SB1    EQU    00H           ; - 1 STOP BIT
00300 SB2    EQU    10H           ; - 2 STOP BITS
00310 PARDIS EQU    00N           ; - PARITY DISABLE
00320 TXENB  EQU    04H           ; - ENABLE TRANSMIT, 0=BREAK
00330 DTR    EQU    01N           ; - DATA TERMINAL READY
00340 ;

00350 ;      ASCII CHARACTERS
00360 ;
00370 STX    EQU    02H           ; START OF TEXT (CTRL-B)
00380 ETX    EQU    03H           ; END OF TEXT (CTRL-C)
00390 CR     EQU    0DH           ; CARRIAGE RETURN (ENTER)
00400 XON    EQU    11H           ; AUX ON (CTRL-Q)
00410 ;
00420 ;      KEYBOARD ESCAPE CHARACTERS
00430 ;

00440 ESCRHS DEFB    00H           ; ESC-0 <NULL>
00450 DEFB    5DH           ; ESC-1 RIGHT SQUARE
00460 DEFB    5CN           ; ESC-2 BACKSLASH
00470 DEFB    5EH           ; ESC-3 CARET
00480 DEFB    5FN           ; ESC-4 UNDERSCORE
00490 DEFB    7BN           ; ESC-5 LEFT CURLY
00500 DEFB    7DH           ; ESC-6 RIGHT CURLY
00510 DEFB    7CN           ; ESC-7 BAR
00520 DEFB    7EH           ; ESC-8 TILDE
00530 DEFB    7FH           ; ESC-9 <DEL>
00540 DEFB    01N           ; ESC-A <SOH>
00550 DEFB    1BH           ; ESC-B <ESC>
00560 DEFB    1FH           ; ESC-C <US>
00570 DEFB    19H           ; ESC-D <EM>
00580 ;
00590 ;      TERMINAL OPTION VARIABLES
00600 ;

00610 TRMOPT EQU    $           ; START OF TERMINAL OPTIONS
00620 FLAGS  DEFB    0           ; FLAGS BYTE
00630 DUPLEX EQU    0           ; - FULL DUPLEX
00640 ESCKBD EQU    1           ; - <ESC> RECEIVED FROM KBD
00650 ESCLIN EQU    2           ; - <ESC> RECEIVED FROM LINE
00660 XOFFTX EQU    3           ; - <XOFF> SENT TO REMOTE
00670 CRTX   EQU    4           ; - <CR> SENT TO REMOTE
00680 RSBAUD DEFB    B300          ; RS-232 BAUD RATE
00690 RSTTYPE DEFB    PAREVN+WD7+TXENB+DTR ; RS-232 UART VALUES
00700 BRXTIM  DEFW    1111H          ; BREAK TRANSMIT TIME
00710 TABTBL  DEFW    0           ; TAB SETTING TABLE
00720 DEFW    0           ; TAB SETTING TABLE

00730 DEFW    0
00740 DEFW    0
00750 HSTSTF  DEFB    STX           ; START-OF-FILE CHARACTER
00760 HSTEOR  DEFB    CR            ; END-OF-RECORD CHARACTER
00770 HPROHP  DEFB    XON           ; PROMPT CHARACTER
00780 HSEOF   DEFB    ETX           ; END-OF-FILE CHARACTER
00790 ;      END OF TERMINAL OPTIONS

00800 ;
00810 ;      DISK FILE AND RS-232 VARIABLES
00820 ;
00830 DCB    DEFB    'PROFILE/TRM' ; DISK FILE DCB
00840 DEFB    CR
00850 DCBFNL EQU    $-DCBFNL
00860 DEFS    50-DCBFNL
00870 IBUFI  DEFW    IBUFF          ; INPUT BUFFER INPUT PTR
00880 IBUFO  DEFW    IBUFF          ; INPUT BUFFER OUTPUT PTR
00890 IBUPC  DEFB    0             ; INPUT BUFFER COUNTER
00900 SPSAVE DEFS    2             ; STACK POINTER SAVE AREA
00910 IBUFF  DEFS    256           ; RS-232 INPUT BUFFER
00920 IBUFE  EQU    $             ; END OF INPUT BUFFER
00930 FILBUF DEFS    256           ; DISK FILE BUFFER
00940 END

```

tem support the XON/XOFF protocol for the file transfer to work correctly. All TRSDOS error messages encountered as the result of disk I/O are displayed in full by calls to ERRDSP.

Program Listing 6

This last section of the program contains only data. Table 3 describes each variable and its function.

Building the Program

Since the program is assembled in six sections, it is necessary to create a single executable command file. Load the six separate command files with the Load command and use the Dump command to create the final module. Since the program is ORGed to start at X'5200', and the Dump command doesn't dump memory lower than X'6000', you must relocate the six parts first with the RELO command, and then use the RELO option of the Dump command, to relocate the final code to its original location.

The easiest way to accomplish this is with a Build command. Each of the six parts is relocated upward in memory by adding X'1E00' to its start address. The offset is then subtracted from the start address in the Dump command. Once EDTASM has been used to assemble each of the six parts of the program, the following sequence of commands creates the final command file.

```

RELO UT1/CMD (ADD=7030)
RELO UT2/CMD (ADD=72FA)
RELO UT3/CMD (ADD=745C)
RELO UT4/CMD (ADD=7520)
RELO UT5/CMD (ADD=79EA)
RELO UT6/CMD (ADD=7E25)
LOAD UT1/CMD
LOAD UT2/CMD
LOAD UT3/CMD
LOAD UT4/CMD
LOAD UT5/CMD
LOAD UT6/CMD
DUMP UTERM (START=7030,END=7E7A,
TRA=5230,RELO=5230)

```

Enhancements

Enhancements are always possible. If you need to have several different profiles available, you could pass the profile file name as a parameter to the program, rather than having a fixed name. The ability to display all control characters received in a visible format (transparency) is sometimes useful when communicating with an unknown system. Cursor addressing could be added to communicate with systems that support such a feature, although

the small screen size could make this impractical.

Additional code in the Intel-format loader could provide checks for load addresses outside of the bounds of available RAM, or for addresses that would overlay the loader program. I did not provide the ability to escape from the loader once it had started (by pressing the break key, for instance), so you might want to add that.

The file-transfer utilities do not send control characters, with the exception of Tab, FF, and CR. Remove this restriction if you want to move files containing such characters. However, you must be careful, since most interactive systems interpret some control characters as something other than data. XON and XOFF are good examples. Backspace is usually treated as the erase character. If you know which control characters cannot be sent as data, you can translate them to something else prior to sending them, or not send them at all.

The file transfer routines strip the parity bit from each character, making it impossible to send or receive any of the special graphics or space compression characters. If the system with which you are communicating can tolerate data with no parity, then you could remove this restriction as well.

Translate tables could be provided to translate each character received or sent. It would require an additional 512 bytes of memory for the two tables. The actual translation is easily implemented in the RS-232 transmit and receive routines, but the mechanism allowing the user to define the contents of the tables would be costly in terms of the code required. These tables would also be saved in the profile, requiring extra code to read and write them on disk.

You could add a number of special-function keys. These would be implemented by the escape sequence described in Listing 1 to generate a string of characters with two keystrokes. Again, such a feature is costly in terms of the amount of code and data area required.

My study of existing communications software for the TRS-80 convinced me that my software program functions as well as most packages costing in excess of \$100. If you tailor it to suit yourself, it should prove to be an adequate tool for most of your communications requirements. ■

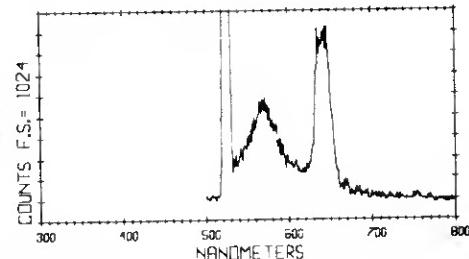
Write to Douglas Payne at 56 Brendawood Crescent, Waterloo, Ontario N2J 4J5, Canada.

Name	Function
ESCHRS	Table of characters used by the escape sequence
TRMOPT	Start-of-terminal option variables which are saved in the profile.
FLAGS	Program flag byte
DUPLEX	Full duplex when set
ESCKBD	Last character typed was (ESC)
ESCLIN	Last character from RS-232 was (ESC)
XOFFTX	(XOFF) sent to RS-232
CRTX	Last character sent during file transfer was (CR)
XOFFRX	(XOFF) received
RSBAUD	Value output to baud rate generator port
RSTYPE	Value output to UART control/status port
BRKTIM	Value used by Delay routine to time the break signal
TABTBL	Table of tab stops
HSTSTF	Start-of-file character
HSTEOR	End-of-record character
HPROMP	Prompt character
HSTEEOF	End-of-file character
DCB	Disk file DCB
IBUFI	Input buffer fill pointer
IBUFO	Input buffer extract pointer
IBUFC	Input buffer character count
SPSAVE	Stack pointer save area
IBUFF	RS-232 input buffer
IBUFE	End of input buffer
FILBUF	Disk file I/O buffer

Table 3. Program variables.

EPSON GRAPHICS

RHODAMINE WT 200 PPT
532 LASER 1.0 KV SLITS 1.0 & 0.5



FROM YOUR
**BASIC • FORTRAN • PL-1 • PASCAL
PROGRAMS**

Grafpac-80 will read data from a disk file on your system and convert it to a hi-resolution plot or graph. Grafpac-80 plots up to 960 dots across and ± 32000 dots vertically on the Epson MX-80 — that's ± 25 pages! ■

Grafpac-80 commands include circle, ellipse, two and three dimensional data, penup/down, plot/move relative or absolute, single character or string plotting with rotation and size control, border generation, and many more.

Grafpac-80 is available for CP/M on 8 inch disk, TRS-DOS (models I and III) on 5 1/4 inch disk. Requires 48K memory. TRS-DOS systems need two disks. ■

Prices: TRS-DOS I & III \$49.95
CP/M \$99.95

(Please include \$3.00 shipping charge with all orders)

* A version is available for TRS-DOS users with one disk, however, you must send us a copy of your TRS-DOS and include \$10.00 for copying.

M.E.S.C. • Parkhurst Drive • Salisbury, MD 21801 • (301) 742-7333

The following are registered trademarks: CP/M - Digital Research, TRS-DOS, TRS-80 - Tandy Corp., MX-80 - Epson Corp.

✓ 398

-COMPUTER SHACK-

SYSTEM II

The ultimate in business programming. A suite of programs written in machine language consisting of Stock Control, Sales Ledger, General Ledger, and Purchase Ledger. The sales ledger issues invoices in addition to statements.

All of the four parts of System II will integrate or may be used on their own. For instance, if the Sales Ledger and Stock Control are used as an integrated system, then issuing an invoice selling two widgets, will deduct those two widgets from stock.

Operator usage, particularly input technique, is made so simple that no training is needed. The operator and machine interaction is plainer - on one simple level - The ultimate in user friendliness.

Function changes are not made through a menu. In other words to change direction you do not have to go back to square one. The same or similar commands are used throughout the suite. If you do not know what to do, you can ask a built in utility to tell you what is available.

For a complete brochure on System II write or call today. Works on the Model I/III or 4

FAMILY TREE

Track down your pedigree with the fast and easy methods provided by FAMILY TREE, the exciting genealogy program. You may be surprised and enchanted by the interesting people you find at the roots of your own family.

It will store separate data for each particular relative, along with that persons mother and father, their sex, date of birth, Place of birth, date of marriage, place of marriage, date of death and place of death. With all of this information the computer can create many different reports such as; a list of descendants or ancestors children, siblings or even an entire family chart.

MODEL I/III tape or disk (32K) \$29.95

CHECK WRITER

This easy to use powerful utility, will take the tedium out of the time consuming task of writing checks, keeping records, and balancing your account. With 99 categories of expenses, sort in seconds on check #, amount, budget #, payee or date.

Great for businesses or home use. The printer program is written in basic for easy modification, while data entry and sorting are done through machine language subroutines.

DISK ONLY \$49.95

PASCAL

The ever popular programming language is brought to the TRS-80 complete in all standards.

We sell Pascal for \$49.95. As you will notice, this price is considerably lower than the competition. This is a very good version of Pascal. At this low price we hope to sell twice as many as the competition!

MODEL I/III DISK \$49.95

SUPER SCRATCH PAD

SCRATCH PAD is the perfect combination of a data base manager and a word processor. Each screen becomes a page that you can easily flip through, each page has a title (one that you type in) that appears in the master menu, each title along with its respective page can be sorted. There are 10 Macro Keys that can be defined for any letter, word, or sentence that you like. And talk about editing, SCRATCH PAD gives you screen editing features just like a full blown word processor. Its all machine language, menu driven - VERY easy to use.

DISK ONLY special intro price only \$39.95 (\$49.95 after October 1)

CYCLE INVOICE SYSTEM

Once each customer is entered, the system takes over, handling billing, recording payments, printing invoices, and all in all, making your life a lot easier. First of all, each customer can be billed weekly, bi-weekly, monthly, quarterly, semi-annual or on an annual schedule. Different invoice cycles can be mixed within the same file. A regular invoice amount is entered for each of these customers. Of course, an invoice adjustment amount can also be entered to allow for overdue charges, sur-charges, delinquent amounts, or credits.

This system is ideal for garbage routes, window washers, land lords, etc.

DISK ONLY \$149.00

SUPER DIRECTORY

SUPER DIRECTORY the fastest, most efficient library catalog utility on the market. SUPER DIRECTORY will sort your complete disk file in a matter of seconds on filespec, disk number, or remarks. It has super fast string search, Reads any normal dos and density, and many many more features.

MANUAL AND DISK \$49.95

DISKS ONLY \$1.79

We buy thousands of bulk disks each month for our own duplication and sales. We would like to offer these disks to you at tremendous savings. These are Super Quality disks guaranteed for life. If they ever go bad send them back and we will replace them FREE. Try some, if you don't like them return them.

100 DISKS TYVEK SLEEVES \$179.95

10 DISKS TYVEK SLEEVES \$19.95

10 DISKS WITH COLORED PLASTIC SLEEVES \$21.95

10 FLIPPY DISKS (use both sides in a normal drive) ... \$29.95

THREE TO FOUR

Take advantage of the higher speed of the Model 4 basic with this new utility that will take a basic program written on the Model III and convert it to work on the Model 4. This program adds all the spaces around the reserved words but will not adjust any peeks and pokes.

DISK ONLY \$24.95

COMPUTER SHACK

1621 East _____ • Pontiac, Michigan 48054

Info. (313) 873-8700 • Orders CALL TOLL FREE (800) 392-8881

✓453

Master Charge and VISA card holders should add 5% for shipping in the U.S.A. 5% for Canada or Mexico. Proper postage is required for U.S. delivery. F.O.B. Pontiac, Michigan. Write for our catalog and price list.

CU 124

-COMPUTER SHACK-

From Computer Shack, the industry leader in computer games, comes 11 great new games. All of these games will run on Models I/III and 4. Almost every order shipped within 24 hours!

JUMBO

You're in the cockpit of a Jumbo 747, preparing for a spectacular flight! As the one and only pilot, all controls will be in your hands.

Written by a professional programmer in conjunction with a B.O.A.C. pilot, JUMBO is most definitely the best flight simulation on the market. It's well done control and indicator board will allow you to feel the plane in motion.

So whether in the past you've flown or not (in the pilot's seat), you'll most definitely find JUMBO an adventure as well as a brilliant educational tool! (not protected).

MODEL I/III TAPE OR DISK \$29.95

LIBERATOR

Adventure, excitement, action, danger and even beautiful girls! Liberators got it all! This fantastic arcade game will get your heart pumping and your mind moving!

1982's most popular arcade game, Donkey Kong, comes to life on your TRS-80 screen through the magic of John Cranes LIBERATOR! And if you thought Donkey Kong was fun, wait until you experience LIBERATOR's five separate screens (more than the arcade version) each utilizing the best sound and graphics possible!

MODEL I/III TAPE \$19.95/DISK \$24.95

ASSAULT

Strap yourself into the dimly lit ATV (All Terrain Vehicle), check the motor, the lasers, and visibility. Now prepare yourself for an underground trip that you won't soon forget... If you live! Assault is an original arcade game designed for the TRS-80 by Bill Dunlevy. It has some of the quickest and fastest graphics ever seen on a Model I/III. The game itself has spiders, little monsters, big monsters, underground caverns, bags of gold and more. It has over 20 different screens.

MODEL I/III TAPE \$19.95/DISK \$24.95

CYBORG

As a competitor in the famous Cyborg arena, you have access to five power sleds! You must now use these sleds to travel through the mazes and collect the signal modules. Of course there is nothing that pleases a crowd more than a little violence, so the makers of the arena have also installed guardian robots within its limits! Using your shield, you must destroy them while trying desperately to complete your task. Cyborg has a total of five different levels, each much more challenging than the one before. Now CYBORG comes unprotected.

MODEL I/III TAPE \$22.95/DISK \$25.95

CLASH

Once again, one of the markets most creative programmers, Bill Dunlevy has created CLASH, a fantastic new arcade simulation! Mounted upon your great white winged stallion, prepare yourself for a clash within the arena. This day, you will be competing against famous riders from all over the planet. As the tournament begins, there is a frenzy of flapping wings and bucking horses, but finally all riders are airborn and the contest has begun. With a firm grasp on the reins, maneuver your horse above the others and then descend upon them. You must dismount the other riders, before their skill prevails and they dismount you.

MODEL I/III TAPE \$19.95/DISK \$24.95

DIG OUT

UH OH! The wackiest game to ever hit an arcade is now invading your computer! As the game begins, you'll find yourself amidst tons of rock and earth. You must dig your way through the surrounding tunnels and hunt down the deadly monsters. But watch out!!! As the hunter, you just might become the hunted. The monsters are strangely powerful, their touch can destroy and their eggs can obliterate. Besides all this, the underground is their natural habitat. DIG-OUT is truly another COMPUTER SHACK classic. In each of its fifteen different levels, DIG-OUT combines the best sound, fantastic graphics, and above all, exciting action.

MODEL I/III TAPE \$19.95/DISK \$21.95

CONVOY

From the creators of DEMON SEED comes a great new game that promises to keep you on the edge of your seat... CONVOY!!

A convoy of trucks has been assigned to move food rations for the troops in the field, but what about the enemy? You must protect the convoy, utilizing the fire power of the armies new super tank, from enemy fighter planes and helicopters seeking to block and destroy the convoy. As planes come rocketing down, destroy their bombs and send them to the ground in flames.

MODEL I/III TAPE \$22.95/DISK \$25.95

FURY

Written by the twice acclaimed Doug Frayer (co-author of Cyborg and Jovian), FURY combines strategy and quick nerves with its three totally different screens. Fury takes you beyond the traditional computer arcade space fight. Allowing one or two players, sound and graphics are used to their utmost and the disk version even talks!

MODEL I/III TAPE \$22.95/DISK \$25.95

MOON ROVER

Moon Rover is an exciting game played on the moon's surface. In your Rover you must shoot down enemy aircraft, jump over wide meteorite holes and rescue your countrymen from certain death. Moon Rover has super graphics and with its many levels of play will never get boring. Moon Rover should become one of your favorite games.

MODEL I/III TAPE \$22.95/DISK \$25.95

STRONGHOLD

Ken Olson and Larry Chow

In Stronghold you have four cities that have built mobile energy shields that'll repel the bombs bouncing around the planet. With all the skill you can muster, protect your city by moving your two shields and stopping the bombs from hitting your city.

One or two player action with sound and split second graphics that'll amaze the eye and ear. That's STRONGHOLD, try it you'll enjoy it!

MODEL I/III TAPE \$22.95/DISK \$25.95

GAUNTLET

One of my favorite games. Operating a super tank you must destroy the enemy. Every building is a barricade every street a battlefield, can you even hope to defeat the hordes of alien tanks? Very fast graphics and exciting sound make this game a must for any arcade game player.

MODEL I/III TAPE \$19.95/DISK \$24.95

COMPUTER SHACK

1011 Eastn ● Pontiac, Michigan 48054 ✓ 109

Info (313) 673-8700 ● Creditors CALL TOLL FREE (800) 392-8881

Master Charge, Visa, American Express, \$5.00 for shipping in the U.S.A. - \$5.50 Canada/Mexico. Payment must be in U.S. funds. Minimum

Mod II File Transfer Utility

by J.H. Nestor

I think computer disk files breed secretly at night. In the darkened security of my computer room, snug within their paper covers, they multiply. ASCII files marry object code files, big files beget little files. First two, then four. They have no shame.

A fantasy nightmare? Maybe. But the contents of my briefcase make this scenario plausible. I've collected a mass of disks, each with its own family of files.

It seems that no matter how carefully I plan things, the files I need are always on another disk. I can't recall how many times I've typed the Copy and Move commands and then waited in vain for those files to be moved.

The problem is less severe with CP/M and Oasis operating systems,

If you're tired of moving Model II files, you'll find this transfer utility indispensable.

which permit flexible wildcarding of commands. For example, the CP/M command PIP B:=A:ACCT?.* sends the files ACCT1, ACCT1.BAS, ACCT2.FOR, and ACCT9.DAT to Drive B.

TRSDOS 2.0 added a limited wildcard capability to some of their commands. For example, the command

MOVE */BAS:0 TO :1 transfers all files with the extension /BAS from drive zero to drive 1.

The wildcard also works on the other side of the equation. Thus, the command: MOVE MYPROG/*:0 TO :I is valid. This command copies any file with the name MYPROG, regardless of its extension.

The addition of the wildcard to TRSDOS 2.0 was an improvement, but it is still not the answer to my file-moving woes. It is not uncommon for me to move a list of two dozen files, none of which meets the wildcard parameters. My solution was to write a Model II file move utility.

The Program

The Transfer program lets you type a list of files to be moved from one disk to another. You can examine the list, correct any errors, and then leave while the file transfer takes place.

I could use the Build command to create a Do file with all of the Copy filename/ext:drivespec to filename/ext:drivespec data for each file to be copied, but that requires a lot of typing. Besides, the Build command is slow and cumbersome.

The Transfer Program

The solution is simple. I wrote a program that creates a Do file, executes it, and then erases it. Well, almost....

The first priority of Transfer is to minimize typing. Why retype the source and destination drive numbers each time? Transfer prompts for these numbers (see Fig. 1) and uses them in every command line. It also inserts COPY and TO in the command (see Fig. 2).

You are asked to enter a list of the file names to be copied. Pressing enter in

```
TRANSFER—File Copy Utility
Enter SOURCE Drive Number.....0
Enter DESTINATION Drive Number....1
Enter File name # 1 or [ENTER] to end list .....SAMPLE/TXT
Enter File name # 2 or [ENTER] to end list .....TRANSFER/BAS
Enter File name # 3 or [ENTER] to end list .....BASCOM
Enter File name # 4 or [ENTER] to end list .....P66/MAC
Enter File name # 5 or [ENTER] to end list .....[ENTER]
Are there any corrections (Y/N)? N
```

Figure 1. Transfer prompts.

```
Assembling COPY File:
COPY SAMPLE/TXT:0 TO :1 ABS
COPY TRANSFER/BAS:0 TO :1 ABS
COPY BASCOM:0 TO :1 ABS
COPY P66/MAC:0 TO :1 ABS
[ENTER] to Execute COPY, [ESC] to Abort
```

Figure 2. Inserted transfer commands.

The Key Box

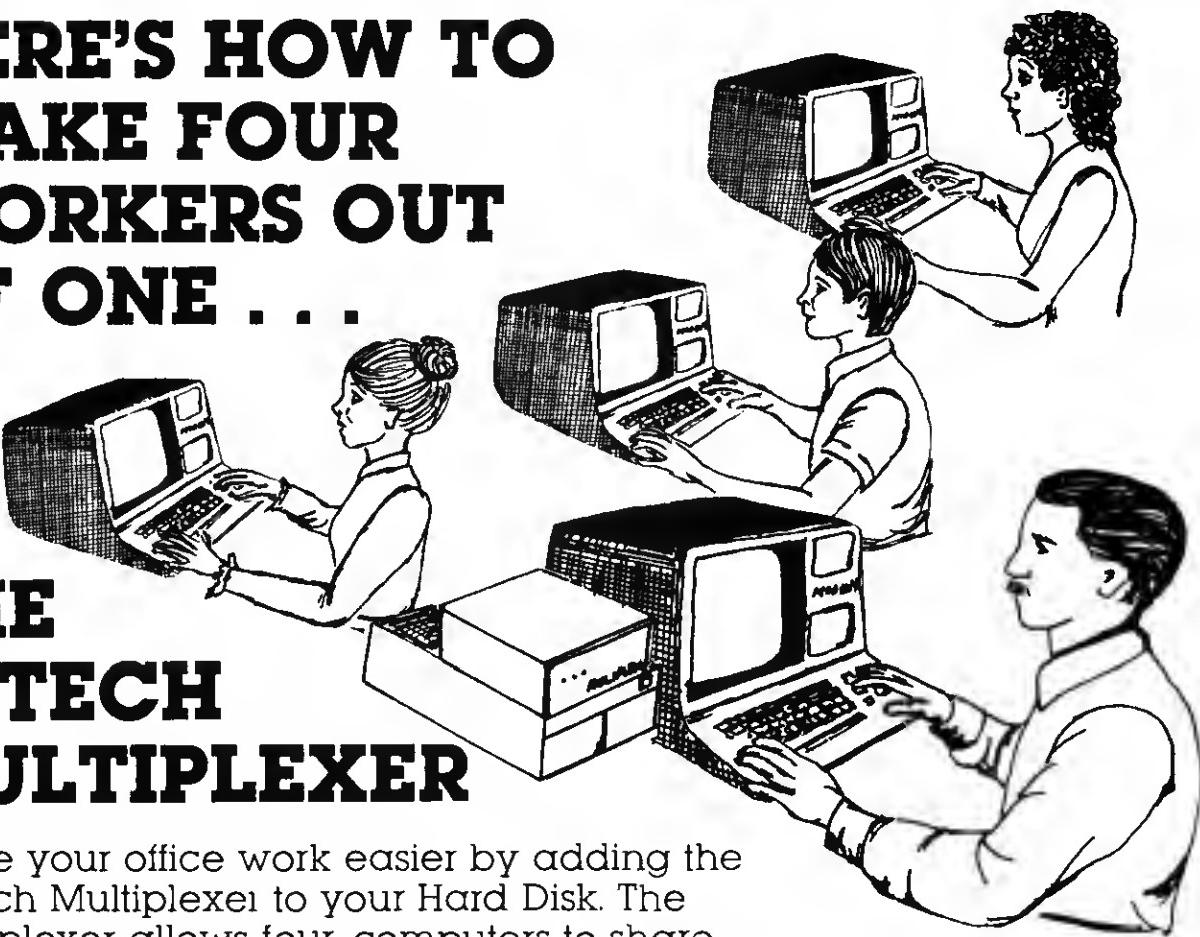
Model II
16K RAM
Disk Basic
TRSDOS

THE COMPUTER CONNECTION



WORK SMART!

**HERE'S HOW TO
MAKE FOUR
WORKERS OUT
OF ONE . . .**



THE BI-TECH MULTIPLEXER

Make your office work easier by adding the Bi-Tech Multiplexer to your Hard Disk. The Multiplexer allows four computers to share the same Hard Disk Data Base.

Bi-Tech's State-of-the-Art Hard Drives are available in 10-, 15- and 20-megabyte formatted capacities and now introducing the first truly reliable 5-megabyte removable cartridge drive. So get it together and let your hard drive work for you and your office.

Four computer system
with Hard Drive and
Multiplexer

\$8950

as low as

*The Bi-Tech Multiplexer is a high-speed parallel device.
Hard Drives and Multiplexers available for most computers.



BT Enterprise Dept. 1-I
100 Curleigh Road
Kingsbridge, N.Y. 11716
(516) 567-8155 (voice) (516) 568-5835 (modem)

Orders Only
300-645-1105

N.Y. call (516) 567-8155

Order Inquiry Welcome
Order subject to availability
N.Y. Residents call 1-800

Amherst, NY 14226 • 716-265-1105
Fax: 716-265-1105

Program Listing

```

10000 : TRANSFER/BAS
10010 : assembles a list of filenames to be copied
10020 : creates a DO file to be executed
10030 : written by J.H.Nestor 9/6/82
10040 :
10050 CLS
10060 CLEAR 1000
10070 DIM A$(100)
10080 GOSUB 11000 ' get the list of files
10090 GOSUB 12000 ' any corrections ?
10100 GOSUB 15030 ' open original do file
10110 GOSUB 16000 ' append new commands
10120 GOSUB 13000 ' execute or abort
10130 END
11000 '
11010 ' get the list of files to copy
11020 '
11030 CLS
11040 PRINT TAB(10)CHR$(26)"      TRANSFER - File Copy Utility
"CHR$(25)
11050 PRINT TAB(18)"Enter SOURCE Drive Number.....";:LINEINP
UT D1$
11060 PRINT TAB(10)"Enter DESTINATION Drive Number....";:LINEINP
UT D2$
11070 PRINT
11080 A%=1
11090 PRINT TAB(10)"Enter Filename # ";:PRINT USING "#";A%;:PRI
NT " or [ENTER] to end list....";:LINEINPUT A$(A%)
11100 IF LEN(A$(A%))=0 THEN N#=A%-1:GOTO 11130
11110 A#=A%+1
11120 GOTO 11090 ' next filename
11130 RETURN
12000 '
12010 ' any corrections ?
12020 '
12030 GOSUB 17000 ' erase
12040 PRINT @ (21,10),"Are there any corrections (Y/N)?";:LINEI
NPUT ANS
12050 IF ANS<>"Y" THEN 12140
12060 GOSUB 17000 ' erase
12070 PRINT @ (21,10),"Enter Filename # ";:LINEINPUT NS
12080 NN#=VAL(NS)
12090 IF NN<1 OR NN>N# THEN 12030
12100 GOSUB 17000 ' erase
12110 PRINT @ (21,10),"Filename # ";NS;" is ";AS(NN)
12120 PRINT @ (22,10),"Enter new Filename # ";NS;"... ";:LINEINPU
T AS(NN)
12130 GOTO 12030
12140 PRINT CHR$(2);:RETURN
13000 '
13010 ' execute COPY or abort ?

```

Listing continued

response to the prompt ends the list. Once it is completed, you can reenter any of the file names in case a mistake was made.

Transfer takes the file names and creates a command such as: COPY MYPROG/ASM:0 TO :1. This command is written to the Do file. When the Do file is completed, you can execute the commands or abort the operation.

How Transfer Works

There are five components to the Transfer program.

The first, Enter Transfer Drives (in lines 11030-11060), clears the screen, prints a heading, and accepts the source and destination drive numbers. String variables D1\$ and D2\$ are used for the drive numbers.

The second, Enter Filenames (in lines 11080-11130), contains the routine to enter the file names. They are entered into the string array A\$(). The array is dimensioned to 100 elements in line 10070, which is actually overkill since TRSDOS accepts only 96 file names including system files. Line 11100 tests the length of the file name entered. Pressing enter without entering a file name produces A\$(A%) with a length of zero, thus ending the entry routine.

The third part of the program, in lines 12000-12140, lets you correct any file name you might have mistyped. Answer Y to the prompt "Are there any corrections (Y/N)?". Enter the offending line number, and reenter the correct file name for that line.

The fourth part builds the Do file. While it should be the easiest part of the

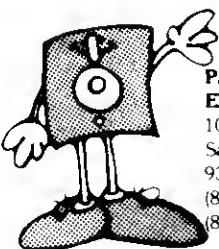
MEMOREX FLEXIBLE DISCS

WE WILL NOT BE UNDER-SOLD!! Call Free (800)235-4137 for prices and information. Dealer inquiries invited and COD's accepted.

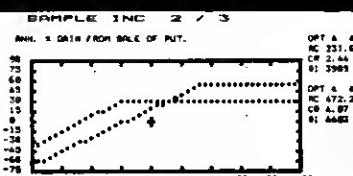


PACIFIC EXCHANGES

100 Foothill Blvd
San Luis Obispo, CA
93401 In Cal call
(805)592-5935 or
(805)543-1037



SAMPLE INC 2 / 3



OPTIONS-80

ANALYZES OPTION INVESTMENTS
HANDLES CALLS, PUTS, SPREADS, BUYING AND SELLING. INCLUDES COMMISSIONS, RISK, COST OF MONEY, DIVIDENDS. PRESENTS RESULTS IN TABULAR OR GRAPHICAL FORM. HARDCOPY AND STORAGE TO DISK. ACCOMPANYING MANUAL A COMPLETE AND UNIQUE GUIDE TO OPTION INVESTING. \$125. M/C AND VISA. MONEY BACK GUARANTEE. SEND FOR FREE BROCHURE.

FOR TRS-80, APPLE & IBM PC.
OPTIONS-80, BOX 471-E
CONCORD, MASS 01742. >206

DISKETTES

MAXELL LIFETIME WARRANTY



5 1/4" 80/HD

28.95

10% OFF
SECOND BOX!

NEW 3M SCOTCH



5 1/4" 80/HD

23.00

VERBATIM

Datalife

5 1/4" 80/HD

24.95

10% OFF
SECOND BOX!

21.95

10% OFF
SECOND BOX!

<b

program, it isn't. I examined a typical Do file and found it to be an ASCII sequential file. When I tried using an editor to create a Do file of the same format, it didn't work. When I issued the command DO MYFILE, TRSDOS responded with error 31, file not found. I checked the directory, and there it was, MYFILE: record length of 1, 87 records long. When I used the TRSDOS Build command to enter the same commands, it worked.

Apparently, the Build file does a special kind of write to the TRSDOS directory when creating a Do file. That could be why it is so slow.

First, I use Build to create a Do file called DOCOPY. The file consists of one statement: CLS. Typing DO DOCOPY clears the screen, and creates a properly designated entry in the TRSDOS directory. To be sure I didn't accidentally erase this precious file, I used the ATTRIB function to give it a password. The command was: ATTRIB DOCOPY (ACC=JHN UPD=JHN PROT=EXEC), and the file is now DOCOPY.JHN.

To append DOCOPY.JHN, the fifth Transfer component, open the file in line 16030 for sequential output. Then write the command strings created in lines 16010-16080 to the file using the statement in line 16090.

When it didn't work, I examined the file DOCOPY.JHN and found that some sort of control character was written into the single CLS statement.

I added program lines 15040 and 16040: line 15040 reads in the first line from DOCOPY.JHN and line 16040 writes it back as the first line of the new file. Whatever was in the file is still there, and it now works.

I mentioned that the program changes the Do file when it is executed; it reuses the same file each time it's used. The OPEN O command in line 15030 erases the existing file when the updated version is written, so that there is only one DOCOPY.JHN file on my disk at any one time.

The fifth part of the program executes or aborts the operation.

There are probably other uses for this method of building and executing a Do file of TRSDOS commands. I plan to explore them as time permits. Perhaps you could even construct a form of Job Control Language. If you find applications for the concept, I would appreciate hearing from you. ■

Dr. J.H. Nestor lives at 39114 Rte. 303, Grafton, OH 44044.

Listing continued

```

13020 '
13030 GOSUB 17000 ' erase
13040 PRINT @ (21,20),CHR$(26) " [ENTER] to Execute COPY, [ESC] t
o Abort ";CHR$(25);CHR$(2)
13050 ANS=INKEY$; IF ANS="" THEN 13050
13060 IF ASC(ANS)<>13 THEN 13110
13070   CLS
13080   PRINT TAB(20)"File Copy in Progress....";CHR$(2);
13090   SYSTEM "DO DOCOPY.JHN"
13100   END
13110 IF ASC(ANS)<>27 THEN 13050
13120   CLS
13130   PRINT TAB(20)"File Copy Aborted....":PRINT
13140   SYSTEM
13150   END
15000 '
15010 ' read 1st line from original do file
15020
15030 OPEN "I",1,"DOCOPY.JHN"
15040 LINEINPUT # 1,A$
15050 CLOSE
15060 RETURN
16000 '
16010 ' append new commands to original do file
16020
16030 OPEN "O",1,"DOCOPY.JHN"
16040 PRINT # 1,A$ ' 1st line from original do file
16050 '
16060 CLS:PRINT TAB(25)"Assembling COPY File:";CHR$(2):PRINT
16070 FOR X%=1 TO N%
16080   A$="COPY "+A$(X%)+"："+D1$+" TO "+D2$+" ABS"
16090   PRINT # 1,A$
16100   PRINT TAB(25)A$
16110 NEXT X%
16120 CLOSE
16130 RETURN
17000 '
17010 ' clear bottom of screen
17020
17030 PRINT @ (21,0),CHR$(24);
17040 RETURN

```

What if your VisiCalc® could read your General Ledger?



It can with VIS\Bridge/GL™ from Solutions, Inc.

You can make even better corporate decisions by using the power of VisiCalc on data from your own General Ledger. □ Solutions' new Bridge product loads information from the Tandy General Ledger package directly into VisiCalc — Automatically! □ Make projections with VisiCalc without re-entering data already in your General Ledger. □ Project current financial data into the future. □ Compare your projections to actual results. □ Store monthly results to spot trends quickly.

Requires any version of VisiCalc, 2 disk drives and the Radio Shack General Ledger (26-4501). Available for TRS-80® Model II/12/16. VIS\Bridge/GL, \$195 + \$4 shipping & handling within U.S. To order phone (802) 229-0368 or write Solutions, Inc., 13 State St., Box 989, Montpelier, VT 05602. Mastercard and Visa. Dealer inquiries welcomed. Also available for Model I, III and II are: VIS\Bridge/REPORT PLUS™ \$95; VIS\Bridge/SORT™ \$89; VIS\Bridge/DI™ \$295.

All VIS\Bridge products are trademarks of Solutions, Inc. VisiCalc® is a trademark of VisiCorp. TRS-80® and Radio Shack are trademarks of Tandy Corp.

Portable Word Processor

by Thomas Hartmann

For anyone who does a lot of writing, word processing is a major boon. A major drawback is the lack of portability of most word-processing systems.

There are a few portable computers around, but try working on an airplane with an Osborne in your lap—without a power source. You might as well be carrying a briefcase full of bricks.

There is a way, though, to combine portability and word-processing capabilities. By interfacing a Sony Typecorder with your Model III, you can have the best of both worlds. That procedure is described here.

Be prepared for the moment when inspiration strikes; carry your word processor with you.

The Typecorder is a small (11 1/8 by 1 3/4 by 8 5/8 inches) and lightweight (3 lbs., 1 oz.) electronic typewriter of sorts. It's actually a dedicated micro-

computer, ROM-equipped to provide a single function—word processing. It has 2K RAM and uses a 40-character liquid crystal display (LCD). Your copy is saved on microcassettes a page at a time, a page being about 30 lines. A single microcassette stores 100 pages of text.

The machine provides a variety of word-processing functions, with dedicated keys for character and word insertion or deletion, and scrolling through a document. You can edit on a page-by-page basis, saving each page on the cassette.

Probably the most exciting feature of the machine, aside from its light weight, thin profile, and versatility, is the fact that its keyboard feels like a conventional typewriter keyboard. The keys are spaced similarly to TRS-80 and other standard keyboards, and emit a faint click when touched. They have just enough of a spring to make them comfortable.

The only differences are the locations of the left shift key (one key over from where it is on the TRS-80), and the apostrophe key (next to the semicolon, as on IBM typewriters). I found these both to be rather inconsequential considerations; my fingers easily adjusted to the slight change.

There's a special display status mode on the Typecorder that locates most documents on the tape without too much trouble and also displays error messages. You can adjust tabs, margins, and the volume of the key clicks from the keyboard.

An unusual feature of the Type-

Character	Word	Suffix	Character	Word	Suffix
A	and	able	V	very	ver
B	been	bility	W	with	ward
C	can	cial	X	experience	
D	down	day	Y	you	
E	even	ent	Z	the	zation
F	from	ful	0	zero	
G	good	ght	1	one	
H	have	hood	2	two	
I	into	ing	3	three	
J	just		4	four	
K	know		5	five	
L	like	less	6	six	
M	more	ment	7	seven	
N	not	ness	8	eight	
O	other	ous	9	nine	
P	people		!	hundred	
Q	quite		@	thousand	
R	right	rent	#	million	
S	said	self	\$	dollar	
T	that	tion	%	percent	
U	united	ugh	'	cent	

Table 1. Basic steno character assignment.

corder originally designed for secretaries and stenographers, but with a little practice usable by anyone, are the Steno keys. These keys, located on either side of the space bar, automatically convert a symbol to a word, or generate suffixes or entire words with a single keystroke.

For example, to type the word "people" you would touch the letter P and hit the Steno key. Instantly the word "people" appears on the display. Each letter has a reserved word that is displayed if that single letter is printed followed by the Steno key.

To produce a suffix, simply type the word without the suffix—for example, "victimiz," and press the Steno key. The word is instantly transformed into "victimization."

Printing a number and then touching the Steno key spells out that number on the screen. This can be done with the words hundred, thousand, million, dollar, percent, and cent. A listing of the Steno key character assignment is shown in Table I.

The typewriter operates for about five hours on a set of batteries, two or three hours if they're rechargeable NiCads. There's also a rechargeable battery pack available from Sony, as

well as 110-volt ac and 12-volt dc power supplies.

I've used the basic 6-volt dc Universal Battery Eliminator available from Radio Shack to power my Typewriter when I lie in bed in the evening and write. The advantage of the Radio Shack unit is that you can reverse the tip polarity, and the Typewriter uses a negative tip and positive ring, the opposite of most battery eliminators. When traveling, I carry two sets of NiCads and a charger/power supply.

To really make use of the Typewriter, you need some way of getting hardcopy. Sony provides three options: their OA-J1110 Communications/Printer Interface, used to interface the Typewriter with the TRS-80, the Sony Compact Printer, and the Sony Electric Typewriter Actuator.

I haven't used the Compact Printer or the Electric Typewriter Actuator that sits over an IBM or other standard typewriter and strikes the keys, so it's difficult to comment on them. Given the proliferation of inexpensive printers on the market, neither appeared to me to be a good buy for the money (the printer is priced over \$800).

The OA-J1110 Communications/Printer Interface gives you QUME-

compatible printer output, an RS-232C Serial output, and a built-in power supply. This device is necessary to connect the Typewriter to the TRS-80, or to send data along modem lines or to serial printers.

Using the Typewriter and Model III Together

Using the Typewriter with the Model III requires some way of getting the data in through the RS-232C port so that it can be saved as a file. There are probably a number of communications and terminal packages designed to use with modems that do this; I've found one of the most versatile, and one ideally suited to the Typewriter, to be Lance Miklus' ST80III.

This program works so well because it's possible to create specific configuration data bases that tell the program to ignore or modify certain incoming signals. Because the Typewriter sends out a string of control codes containing page numbers and other information that isn't accepted by the Model III, you get some strange screen changes as data is accepted through the serial port with a standard terminal package.

To set up the ST80III, run the Basic program, Tconv/BAS, that comes on



Definitely **THE BEST** of the space games for the **TRS-80[®] MOD I/III**

★ 1,2 or 3 SIMULTANEOUS players!

- Each piloting a separate space ship

★ Incredibly realistic graphics!

★ Fast arcade response!

★ Options individually selected!

- Meteors • Blackhole Gravity
- Flying Saucers • Objects & Mines
- Bounce or Wrap-Around Screen
- Weapons: Missiles or Lasers

★ Difficulty options selectable!

- # of Saucers • Saucer Speed
- Space Ship Power • Gravity Force
- Meteor Speed • Fuel Supply
- Weapon Supply • Laser Length

★ Sophisticated ship controls!

- Variable thrust level • Rotation • Flip
- Fire left or right barrel • Hyperspace

★ Cooperative or Competitive!

- Numerous scoring options
- 1 player can fly 2 ships -1 with each hand!

★ Alpha & Tristar compatible! ★ Sound

32K Disk \$29.95 or 16K Tape \$26.95

Specify MOD I or III. 22 page manual included.

California residents add 6% sales tax.

Outside USA (except Canada) add \$10.00

Copyright 1983 by John McAfee

T.M. TANDY CORP.

**SOFT SYSTEMS
& CONSULTING**

PO BOX 60031 Santa Barbara, CA 93160



Profile III Plus[®] - 108 insert pages for your manual with plain English explanations and examples including two 16x22 wall charts showing where program goes and why \$14.00

General Ledger - Insert pages for the TRS-80[®] Mod III Disk Manual clarifying the obscure. Section on HOW accounts interact and produce statements. 19x25 two-color wall chart shows Flow, Commands, Tips \$14.00

Super SCRIPSIT[®] - 19x25 two-color wall chart shows commands with explanations and tips in highly visible form \$4.00

VisiCalc[®] - 19x25 two-color wall chart shows All THOSE commands with clear explanations at a glance \$4.00

© - Copyrights of Tandy or VisiCorp

Send cash, check, money order to:
CREST SOFTWARE 223

2132 Crestview Drive • Durango, CO 81301

(303) 247-9518

Visa, MC accepted, include card # and expiration date.

(Add \$2.00 Shipping — We use UPS)

TIME SAVING — MONEY SAVING PRINTER BUFFER



SPOOL-Z-Q

Spool-Z-Q accepts characters at computer speed and feeds them to your printer at its much slower speed. This eliminates the time you waste waiting for your printer to finish before you can use your computer.

FEATURES

Spool-Z-Q is perfect for use with all parallel (Centronics standard) printers including Radio Shack printers. Spool-Z-Q is stand-alone, it doesn't steal power from the computer or printer. The many advanced features include automatic internal space character compression, copy and self-test functions, and a special "Pause-on-Formfeed" mode.

SIZES AND EXPANSION

Spool-Z-Q comes in 32K, 64K, and 128K character sizes. Any Spool-Z-Q can be user expanded to 64 or 128K by just plugging in chips — the sockets are already installed. There are no jumpers to fool with either, Spool-Z-Q knows how much memory is installed without being told.

15 DAY TRIAL PERIOD

You may try Spool-Z-Q with your system and, if you aren't completely satisfied, return it within 15 days for a no-hassle full refund.

FACTORY DIRECT PRICES
(Shipping included)

32K — \$219

64K — \$249

128K — \$309

Cable to printer — \$27

California residents include 6% sales tax. We accept Master Card, Visa, AMEX, and C.O.D.

JVB ELECTRONICS
1601 Fulton Av., Suite 1
Sacramento, CA 95825
(916) 483-0709 121

the ST80III disk. From the menu, go to the Change Video Translation Table and change it so it's set up as in Table 2. From the main menu, save this new translation table with the name Sony/TBL onto the disk with your ST80III/CMD program.

To run the entire system, first write a document on your Typecorder. My first experiment was a 20,000-word sci-fi novella that was great fun. I did it on the train between my home in New Hampshire and my office in New York City, over the course of about three weeks. I'd suggest you set the right margin at 63 on the Typecorder, as this makes things easier later on (the maximum margin on the TRS-80 is 63).

Then, hook the communications interface up to the RS-232C port on the Model III. Plug the cables from the interface into the Typecorder and rewind the tape to the beginning of your document. Touch the play button to load the first page of your document into the Typecorder's RAM.

On the TRS-80, type "ST80III SONY" from TRSDOS. The terminal package loads and accesses your new translation table. Open the memory buffer by performing a TEC "C" command and, if you want the copy to go to

```

05 ENQ = 00 Null
06 ACK = 00 NULL
09 Tab = 00 Null
0A Line Feed = 00 Null
0C Form Feed = 00 Null
0D Return = 20 SPACE
10 DLE = 00 Null
12 DC2 = 00 Nul
14 DC4 = 00 Null
17 ETB = 00 Null
1A Sub = 00 Null
1B Escape = 00 Null
1C FS = 00 Null
1E RS = 00 Null
1F US = 00 NULL

```

Table 2. Video Translation Table for the ST80III package to create the Sony/TBL file.

your printer simultaneously, a TEC "P" command.

Hold down the Code button on the Typecorder and touch either the Y or X key. Code Y sends the entire document, page after page, to the TRS-80. Code X sends only one page at a time.

The Typecorder displays "IN COMMUNICATION" and the screen of your TRS-80 should busily scroll with the document you transferred from the Typecorder tape. After about 15 pages

are loaded (if your document is that long—the display of the Typecorder tells you which page you're on), it's a good idea to break the text with the Typecorder's Reset button and save the file, because this is approaching Scripsit's memory limit on a 48K machine.

Save the file by executing a TEC "X" to close the memory buffer, and a TEC "F" to prompt you for a file name and write the file to disk. Then, you can go back to a TEC "C" to begin with a new file and a clean buffer to load the rest of your document.

The last step is to go to Scripsit or some other word-processing program and edit the document. I've been using Scriplus, a useful modification to Scripsit.

You'll notice when you load the document that at the end of each line is a forced line feed symbol. This occurs because each line on the Typecorder requires a forced line feed. For many applications this presents no problem. I prefer to have more flexibility in formatting my printouts, however, so, after setting my right margin on the screen at 63 with a "Break: W=63" command, I simply run through the document laying a space on top of (replacing) each line feed, except those at the ends of paragraphs. This takes about 25 minutes for a 20,000-character file, and also presents a good opportunity to do some editing and review.

I could have configured the ST80III to ignore all the line feeds, but then I'd have to go back over the document and locate all paragraph beginnings to insert a line feed. I tried this, and it was too confusing, so I settled on the above procedure.

Summary

Anyone who uses a typewriter more than 10 or 15 hours a week and also travels will probably find that the Typecorder/Model III combination is hard to beat. It's versatile, portable, easy to use, and relatively uncomplicated.

Now I can write in bed, on the train or plane, in the car, sitting outside on a sunny afternoon, or anywhere the spirit moves me. If you write for a living or as a hobby, and have the money to spend on a new toy, you can't beat the combination and quality of the Sony Typecorder in concert with a Model III. ■

Your Computer Can Talk With DIGY SPEECH SYNTHESIS KITS

TYPICAL APPLICATIONS:

- Industrial • Games
- Educational • Security Systems

Kits contain all parts needed for functional, high quality speech synthesizer. Manuals guide you to a successful project.

DIGY I—
"90" use on parallel printer port for Models I, III, & IV computers. 143+ word vocabulary.

DIGY II—
"125" Use on Model III & IV I/O buss, Model I expansion bus. 143+ word vocabulary.

DIGY II+ Same as DIGY II with 274
"165" word vocabulary.

Kits require +9v per supply, cable & 8-OHM speaker. Assembled and tested versions add \$30.00.

All parts guaranteed for 90 days

ARGONAUT SYSTEMS

3847 Geleburg Ct.

Arlington Hights, IL

60004 (312)255-6443

Money orders or CODs shipped same day. COD orders add *3%. Orders with personal checks allow 3-4 weeks for delivery. DIGY not offered in Illinois. Inquire about our qualified dealer quantity discounts.

✓229

TRS-80 MODEL II DISPLAY MANAGEMENT SYSTEM



Do you intend to use first generation CRT management techniques forever?

When for \$89.00 you can have:

- An interactive screen generator that requires no programming.
- A runtime screen manager that you don't need assembly language knowledge to use.
- A Control panel that lets you run the show from your program, in your language (Cobol/Basic/Assem.)

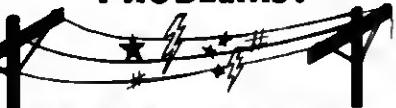
MICROWAVES

Computer Products
Bridle Road, Antrim N.H. 03440
Tel. 603-588-6746

✓548

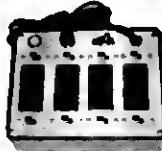
Contact Thomas Hartmann at 5 Garland St., Plymouth, NH 03264.

POWER LINE PROBLEMS?



SPIKE-SPIKER® ...THE SOLUTION

Protects, organizes, controls computers & sensitive electronic equipment. Helps prevent software "glitches", unexplained memory loss, and equipment damage. Filter models attenuate conducted RF interference. 120V, 15 Amps. Other models available. Ask for free literature.



**DELUXI POWER CONSOLE
\$79.95**

Transient absorber, dual 3 stage filter, 8 individually switched sockets, fused, main switch, & lite.

QUAD-II \$59.95

Transient absorber, Dual 3 stage filter, 4 sockets, lite.

QUAD-I \$49.95

Transient absorber, 4 sockets.

MINI-II \$44.95

Transient absorber, 3 stage filter, 2 sockets.

MINI-I \$34.95

Transient absorber, 2 sockets.



215-837-0700

Out of State Order Toll Free



800-333-9685

KACLO® - 485

6584 Ruch Rd., Dept. 80

Bethlehem, PA 18017

DEALER INQUIRIES INVITED • CODS add \$3.00 + Ship.

150 Programs for Business & Home— \$49.95

Designed for Radio Shack®
Model I (Tape)
Model III (Disk) Computer
Executive Calculator Software Package™

Over 150 high-quality, user-proven programs integrated into a comprehensive software system you can afford!

Includes programs for:

Finance/Real Estate/Investments
Loans/Leases/Depreciation
Charts & Graphs
Plus many, many more.

All this for only \$49.95

- Over 150 user-proven programs
- Complete Users Guide
- Automatic Update Privileges
- Complete Source Code
- Money Back Guarantee
- Shipping cost included
- Orders shipped within 24 hours
- Compatible to 48K, Disk or Tape

Order today with confidence by telephone or mail. Visa, Master Card accepted.

MCS SOFTWARE

809 Parkway, Conway, Arkansas 72023
Phone: 501-327-4443

✓393

MODEL 12 SINGLE DRIVES

\$2683.00

TC3



Model 12

Dual Drives

\$3354.

We supply Radio Shack Components and Parts

Orders over \$1500
10% over cost

Call or Write
for price list or rates

Texas Computer Components (TC3)

317 Green Ave.

Toll. Fr. 78395

Phone 1-512-729-4073

1981

1982

1983

LOAD 80 CASSETTES & DISKS - Back Issues

If you have not yet ordered any Load 80 tapes or disks and wish you had, don't worry. We are now offering a "BACK ISSUE" inventory clearance. You can order nearly any Load 80 starting from September of 1982 to date. We do have limited quantities, so order early to avoid disappointment! Back issues of *80 Micro* are also available. With complete documentation found in the companion magazine, you should have no difficulty loading any of the programs listed on Load 80.

Please send the following:

Month _____ Year _____

Cassettes _____

Month _____ Year _____

Disks _____

Prices _____

Load 80 Cassettes \$9.97 (plus \$1.50 for postage and handling)

Load 80 Diskettes \$19.97 (plus \$1.50 for postage and handling)

Foreign Air Mail \$1.95 per item for postage and handling

U.S. Funds drawn on U.S. Banks Only

Check/Money Order MC AE VISA

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Card #: _____ Exp. Date: _____

Signature: _____

Please Allow 3-4 Weeks Delivery

LOAD 80 attn: Debbie Walsh • Pine Street • Peterborough, NH 03458

9/83

80 micro BOOK SHELF

THE PERSONAL COMPUTER BOOK—Peter A. McWilliams. You've read all about personal computers and you're not quite sure what they are. This book has the answers to your questions. It's funny, and you'll get a kick out of reading it, but you'll learn what personal computers are, what they can do, and what they cost. There are chapters on programming, word processing, business, games, education, kids and computers. You'll also find out what computers cannot do and how to figure out if you need one. A special name-brand buying guide presents detailed information on the most popular models and some you may not have heard of to help you select a system. You won't find a lot of jargon or technical information that's way over your head. You'll find an amusing and informative introduction to personal computers. BK1279 \$9.95

THE WORD PROCESSING BOOK A Short Course in Computer Literacy—Peter A. McWilliams. If you've heard about "word processing" and have no idea what that means, Peter A. McWilliams tells you all about it. Even if you know nothing at all about computers, this book sheds some light on word processing in a humorous and informative fashion. The book has three sections—What Word Processing Computers Are and What They Do, The Uses of Word Processing Computers, Selecting and Purchasing a Word Processing Computer. Topics include an introduction to computers, word processing for school, business, writers, the self-employed, selecting a word processing computer, deciding if a word processor is right for you, and the disadvantages of word processing. A special feature is the name brand buying guide which gives evaluations of some of the most popular personal computers, printers, and word processing software. BK1278 \$9.95

40 COMPUTER GAMES FROM KILOBAUD MICROCOMPUTING—Forty games in all in nine different categories. Games for large and small systems, and even a section on calculator games. Many versions of BASIC used and a wide variety of systems represented. A must for the serious computer gamesman. BK7381 \$7.95*

INTRODUCTORY/GAMES

DON'T (or How to Care for Your Computer)—by Rodney Zaks. In plain language, with numerous illustrations, this book tells all the do's and don'ts of the care, preservation and correct operation of the small computer system. Specific chapters cover each piece of hardware and software, as well as safety and security precautions and help for problem situations. Have your computer work right the first time and keep it working. No technical background required. For all computer users. BK1237 \$11.95

YOUR FIRST COMPUTER—by Rodney Zaks. Whether you are using a computer, thinking about using one or considering purchasing one, this book is indispensable. It explains what a computer system is, what it can do, how it works and how to select various components and peripheral units. It is written in everyday language and contains invaluable information for the novice and the experienced programmer. (The first edition of this book was published under the title "An Introduction to Personal and Business Computing".) BK1191 \$8.95*

MICROPROCESSOR INTERFACING TECHNIQUES—by Austin Lessea & Rodney Zaks—will teach you how to interconnect a complete system and interface it to all the usual peripherals. It covers hardware and software skills and techniques, including the use and design of model buses such as the IEEE 488 or S-100. BK1037 \$18.95*

CAPTAIN 80 BOOK OF BASIC ADVENTURES—by Robert Liddil. This book contains 18 of the most popular Adventure programs available today; all in one easy to read book with listings ready to be keyed in to your computer. This unique book also contains an ADVENTURE GENERATOR program, not available from any other source. This generator program will actually write another BASIC ADVENTURE PROGRAM! Although specifically written for the TRS-80 Model I & III these programs are adaptable to other computers using Microsoft BASIC. BK1240 \$19.95

COMPUTERS FOR EVERYONE 2nd Edition—by Jerry Willis and Mert Miller. This new, updated edition shows you how computers can be used in your home, office or school. It explains what computers can do and features a consumer's guide of the more popular computers to help you decide which one to buy and who to buy it from. There's even a chapter devoted to software that describes over 100 programs currently available. Also included are chapters on peripherals, telecommunications and computers in education. Abounds with colorful photographs. BK1260 \$5.95

A USER GUIDE TO THE UNIX SYSTEM by Jean Yates and Rebecca Thomas. Here at last is a clearly written book that allows you to use the Unix operating system easily, and at a fraction of the time it previously took. If you're using, evaluating or simply curious about this system, this is your book. BK1242 \$17.95

WORDSTAR MADE EASY by Walter A. Etting. Now WordStar is as simple to learn as it is easy to use. This book teaches WordStar in 14 easy lessons, saving hours of hard work. It comes with a convenient pull-out Command Card. BK1239 \$12.95

INTRODUCTION TO WORD PROCESSING by Hal Glatzer. This book explains in plain language what a word processor can do, how to use one, how it improves productivity—especially in businesses that handle lots of words—and how to buy one wisely. No technical knowledge required, for all first-time users and those considering purchasing a word processor. BK1238 \$12.95

Introduction to
WORD PROCESSING



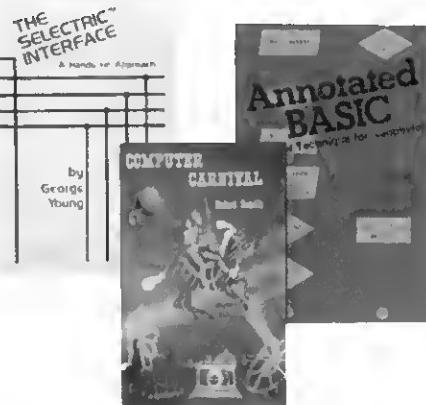
THE NEW WEATHER SATELLITE HANDBOOK—by Dr. Ralph E. Taggart WB8DOT. Here is the completely updated and revised edition of the best-selling *Weather Satellite Handbook*—containing all the information on the most sophisticated and effective spacecraft now in orbit. Dr. Taggart has written this book to serve both the experienced amateur satellite enthusiast and the newcomer. This book is an introduction to satellite watching, that tells you how to construct a complete and highly effective ground station. Not just ideas, but solid hardware designs and all the instructions necessary to operate the equipment are included. An entire chapter is devoted to microcomputers and the Weather Satellite Station, and for the thousands of experimenters who are operating stations. The *New Weather Satellite Handbook* details all the procedures necessary to follow the current spacecraft. Weather Satellite contains Operation Satellite Systems, Antenna Systems, Weather Satellite Receivers, A Cathode Ray Tube (CRT) Monitor for Satellite Picture Display, A Direct-Printing Facsimile System for Weather Satellite Display, How to Find the Satellite, Test Equipment, Microcomputers and the Weather Satellite Station, Station Operations. BK7383 \$8.95*

ANNOTATED BASIC—A NEW TECHNIQUE FOR NEOPHYNES—BASIC programming was supposed to be simple—a beginner's programming language which was so near to English that it could be easily understood. But, in recent years, BASIC has become much more powerful and therefore much more difficult to read and understand. BASIC simply isn't basic anymore.

Annotated BASIC explains the complexities of modern BASIC. It includes complete TRS-80® Level II BASIC programs that you can use. Each program is annotated to explain step-by-step the workings of the program. Programs are flowcharted to assist you in following the operational sequence. And—each chapter includes a description of the new concepts which have been introduced.

Annotated BASIC deals with the hows and whys of TRS-80 BASIC programming. How is a program put together? Why is it written that way? By observing the programs and following the annotation, you can develop new techniques to use in your own programs—or modify commercial programs for your specific use. **Annotated BASIC Volume 1** BK7384 \$10.95 **Annotated BASIC Volume 2** BK7385 \$10.95 Order Both Volumes and Save! BK738402 \$18.95

WAYNE GREEN BOOKS



THE SELECTRIC INTERFACE—by George Young. You need the quality print that a daisy wheel printer provides but the thought of buying one makes your wallet wilt. **SELECTRIC INTERFACE**, a step-by-step guide to interfacing an IBM Selectric I/O Writer to your microcomputer, will give you that quality at a fraction of the price. George Young, co-author of *Kiobaud Microcomputing* magazine's popular "Kiobaud Classroom" series, offers a low-cost alternative to buying a daisy wheel printer. **SELECTRIC INTERFACE** includes: step-by-step instructions, tips on purchasing a used Selectric, information on various Selectric models, including the 2740, 2980, and Dura 1041, driver software for Z80, 8080, and 6502 chips, tips on interfacing techniques. With **SELECTRIC INTERFACE** and some background in electronics, you can have a high-quality, low-cost, letter-quality printer. Petals not included. BK7388 (125 pages) \$12.97

*Use the order card in this magazine or itemize your order on a separate piece of paper and mail to: 80 Micro Book Department • Peterborough NH 03458. Be sure to include check or detailed credit card information. No C.O.D. orders accepted. \$1.50 for the first book, \$1.00 each additional book for U.S. delivery and foreign surface. For foreign airmail \$10.00 per book. Please allow 4-6 weeks for delivery. Questions regarding your order? Please write to Customer Service at the above address.

For Toll Free Ordering Call 1-800-258-5473

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

SPECIAL INTERESTS



DOS RANDOM ACCESS & BASIC FILE HANDLING—By H.J. Muller. This book was written for the nonprogrammer. It is ideal for the businessman or professional who needs to solve and write special programs for in-house business problems, or the hobbyist who wants to go beyond the cassette recorder and into disk storage and file manipulation. It is written as a self-instruction tutorial and will provide anyone with some Level II experience with the ability to write special programs for inventories, mailing lists, work scheduling, record keeping, research project data manipulation, etc. 150 pages. BK1236 \$29.50

TRS-80 DISK AND OTHER MYSTERIES—by Harvad C. Pennington. This is the definitive work on the TRS-80 Model I disk system. It is full of detailed "How-to" information with examples, samples and in-depth explanations suitable for beginners and professionals alike. The recovery of one lost file is worth the price alone. BK1181 \$22.50.*

MICROSOFT BASIC DECODED AND OTHER MYSTERIES—by James Earvor. From the company that brought you *TRS-80 DISK AND OTHER MYSTERIES*, contains more than 6500 lines of comments for the disassembled Level II ROMs, six additional chapters describing every BASIC subroutine, with assembly language routines showing how to use them. Flow charts for all major routines showing how to use them. Flow charts for all major routines give the reader a real insight into how the interpreter works. BK1186 \$29.50.*

MACHINE LANGUAGE DISK I/O AND OTHER MYSTERIES—by Mike Wagner. The purpose of this book is to inform anyone familiar with Z-80 assembly language programming how to control the TRS-80 Model I and III disk drive interrupt systems. Driver routines for every function described, with abundant examples, are included in this book. It also covers utilization of TRSDOS assembly language file I/O calls and techniques. BK1258 \$29.95

MOD III ROM COMMENTED—Soft-Sector marketing, 1981. This book is not an instruction course on machine language, but rather an information source that you can use time and time again for writing your own program or patching old Mod I machine language programs. It contains an explanation of ROMs in the latest machine from Tandy, with most every location of the 14K ROMs listed, with comments. BK1235 \$22.50.

THE CUSTOM TRS-80 AND OTHER MYSTERIES—by Dennis Kitsz. More than 300 pages of TRS-80 customizing information. With this book you'll be able to explore your computer like never before. Want to turn an 8 track into a mass storage unit? Individual reverse characters? Replace the BASIC ROMs? Make Music? High speed, reverse video, Level I and Level II? Fix it if it breaks down? All this and much, much more. Even if you have never used a soldering iron or read a circuit diagram, this book will teach you how! This is the definitive guide to customizing your 80! BK1218 \$29.95.*

BASIC FASTER AND BETTER AND OTHER MYSTERIES—by Lewis Rosenthaler. You don't have to learn assembly language to make your programs run fast. With the dozens of programming tricks and techniques in this book you can sort at high speed, swap screens in the twinkling of an eye, write INKEY routines that people think are in assembly language and add your own commands to BASIC. Find out how to write elegant code that makes your BASIC really hum, and explore the power of USR calls. BK1221 \$29.95.*

THE CP/M HANDBOOK (with MP/M)—by Rodney Zake. A complete guide and reference handbook for CP/M—the industry standard in operating systems. Step-by-step instruction for everything from turning on the system and inserting the diskette to correct user discipline and remedial action for problem situations. This also includes a complete discussion of all versions of CP/M up to and including 2.2, MP/M and CPOS. BK1187 \$14.95.*

MASTERING CP/M—by Alan R. Miller. For advanced CP/M users or systems programmers who want maximum use of the CP/M operating system, this book takes up where the *CP/M Handbook* leaves off. It will give you an in-depth understanding of the CP/M modules such as CCP (Console Command Processor), BIOS (Basic Input/Output System), and BDOS (Basic Disk Operating System). It explains the incorporation of additional peripherals to the system, console I/O, the use of the file control block and much more. It also includes a library of useful macros and a comprehensive set of appendices. BK1263 \$18.95

80 micro BOOK SHELF



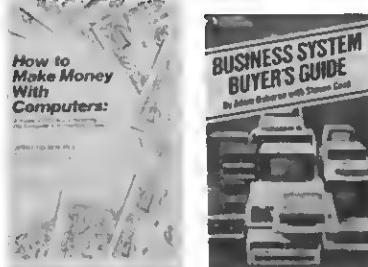
TRS-80 DATA COMMUNICATIONS SYSTEMS—by Frank J. Dertler. If you are interested in using the TRS-80 as a terminal or message system, this is the book to buy. It covers communications, technical material, software and hardware for the entire TRS-80 family of machines. BK1245 \$12.95

MODEL III TRSDOS COMMENTED—Published by Soft Sector Marketing. This book is intended to show moderately experienced programmers the organization and inner workings of a typical Z-80 disk operating system. Every function of the operating system has been decoded and explained, not to bit-by-bit detail, which would be a monstrous task, but rather at an instruction-by-instruction level. Many not-documented features of the system have been found, as well as a few errors. The techniques shown in the system coding will be useful as a guide to programmers interested in systems programming at an assembler level. BK1257 \$29.95

INSIDE SUPER UTILITY PLUS—by Paul Weiner. This book really explains *all* the mysteries and functions of that remarkable program—Super Utility Plus. This is an excellent tutorial on TRS-80 disks, it contains detailed instructions for recovering bad disks using Super Utility Plus, and also documents previously undocumented features of SUP. This is an excellent companion book to the Super Utility Plus manual. BK1269 \$19.95

TRSDOS 2.3 DECODED AND OTHER MYSTERIES—by James Less Farvor. This book is intended to guide the beginning or experienced system programmer through the internal operations of the TRSDOS operating system used on the Radio Shack Model I computer. A knowledge of basic computer architecture and assembly language programming is assumed, however the significant features of both are presented in the text. An absolute must-have for Model I owners! BK1276 \$29.95

MONEYMAKING/BUSINESS



HOW TO MAKE MONEY WITH COMPUTERS—In 10-information-packed chapters, Jerry Felsen describes more than 30 computer-related, money-making, high profit, low capital investment opportunities. BK1003 \$15.00.*

SMALL COMPUTERS FOR THE SMALL BUSINESS-MAN—By Nicholas Rosa and Sharon Rosa. Here is an excellent guide for businessmen who are interested in finding out what a computer can do for their business, but are not interested in becoming "computer nuts." The authors are consultants who assess the computer needs of businessmen and who touch base with everything necessary to consider before purchasing a computer. The authors tell readers how and where to shop successfully for a computer; what to expect their computer to do for them; how large a computer to consider; how to select software; whether or not to use a consultant; how to introduce the computer to the staff, and much more. Specific topics addressed include accounting records, warehousing, light factory operation and parts inventories. BK1222 \$12.95*

SO YOU ARE THINKING ABOUT A SMALL BUSINESS COMPUTER—By Richard G. Canning and Nancy C. Leaper. For a well-organized manual on the process of selecting the right computer system for your small business, this text can't be excelled. Designed to introduce the novice in data and word processing to the real benefits of computerization, the book is filled with money- and time-saving tips, photos of equipment, lists of suppliers, prices, explanations of computer terminology, and helpful references to additional sources of information. Everyone contemplating a first computer installation should have this book. BK1222 \$14.00*

USING MICROCOMPUTERS IN BUSINESS—By Stan Vail. Written by the owner/manager of one of the country's largest computer stores selling systems to small businesses, this book is an essential background briefing for any purchaser of microcomputer systems or software. In a fast-moving style, without the usual buzz words and technical jargon, Vail answers the most often asked questions. **CONTENTS:** How a computer can help your business; Data base management to advance your business; Effective use of word processing; How to use a computer without disrupting your business; Buying your system; Computer languages; What are the limitations of the microcomputer; Software: where to find it, how to judge it; What to do when the computer goes down. BK1225 \$9.95*

BUSINESS SYSTEM BUYER'S GUIDE—By Adam Osborne with Steven Cook. When you enter the market place of small business computers, you face a bewildering array of products, prices, features and fables. This guide cuts through the jargon and unravels the task of buying the right computer system. This book provides solid information on how to determine your needs, how to choose software and hardware for all business applications, what to expect from vendors, what to avoid, and what questions you must ask. It also provides a wealth of detailed information on products, manufacturers, retailers and the whole microcomputer market. BK1229 \$9.95

*Use the order card in this magazine or itemize your order on a separate piece of paper and mail to: 80 Micro Book Department • Peterborough NH 03458. Be sure to include check or detailed credit card information. No C.O.D. orders accepted. \$1.50 for the first book, \$1.00 each additional book for U.S. delivery and foreign surface. For foreign airmail \$10.00 per book. Please allow 4-6 weeks for delivery. Questions regarding your order? Please write to Customer Service at the above address.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

For Toll Free Ordering Call 1-800-258-5473

80 micro BOOK SHELF

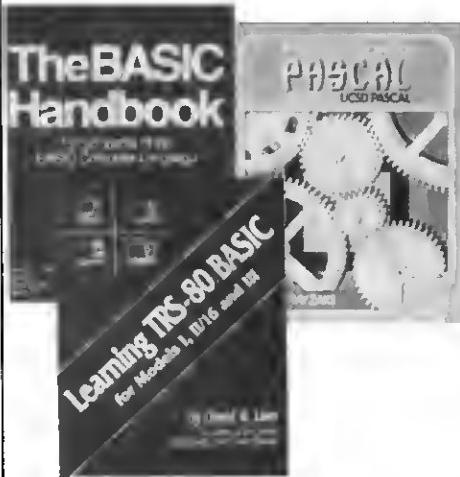


INSIDE LEVEL II—For machine language programmers. This is a comprehensive reference guide to the Level II ROMs, allowing easy utilization of the sophisticated routines they contain. It concisely explains set-ups, calling sequences, variable passage and I/O routines. Part II presents an entirely new composite program structure which unloads under the SYSTEM command and executes in both BASIC and machine code with the speed and efficiency of a compiler. Special consideration is given to disk systems. BK1183 \$15.95.

Z-80 ASSEMBLY LANGUAGE PROGRAMMING—by Lance A. Leventhal. This book thoroughly covers the Z-80 instruction set, abounding in simple programming examples illustrating software development concepts and actual assembly language usage. Features include Z-80 I/O devices and interfacing methods, assembler conventions, and comparisons with 8080A/8085 instruction sets and interrupt structure. BK1177 \$16.95.

TRS-80 ASSEMBLY LANGUAGE—by Hubert S. Howe, Jr. This book incorporates into a single volume all the pertinent facts and information you need to know to program and enjoy the TRS-80. Included are clear presentations of all introductory concepts, completely tested practical programs and subroutines, details of ROM and RAM and disk operating systems, plus comprehensive tables, charts and appendices. Suitable for the first time user or more experienced users. BK1217 \$9.95.

PROGRAMMING THE Z-80—by Rodney Zaks. Here is assembly language programming for the Z-80 presented as a progressive, step-by-step course. This book is both an educational text and a self-contained reference book, useful to both the beginning and the experienced programmer who wish to learn about the Z-80. Exercises to test the reader are included. BK1122 \$16.95.



*Use the order card in this magazine or itemize your order on a separate piece of paper and mail to: 80 Micro Book Department • Peterborough NH 03458. Be sure to include check or detailed credit card information. No C.O.D. orders accepted. \$1.50 for the first book, \$1.00 each additional book for U.S. delivery and foreign surface. For foreign airmail \$10.00 per book. Please allow 4-6 weeks for delivery. Questions regarding your order? Please write to Customer Service at the above address.

PROGRAMMING•6809



Nanos System REFERENCE CARDS FOR MODELS I, II, III, COLOR AND POCKET COMPUTERS!

At last! No more flipping through the pages of the BASIC manual! No more working through the maze of machine language instructions! These cards completely summarize the BASIC and Assembler manuals! FEATURES INCLUDE: memory map, eyeball graphics, math instructions, BASIC commands, store instructions, BASIC functions, load instructions, BASIC statements, move instructions, special keys, exchange instructions, PRINT USING examples, shift instructions, BASIC special characters, compare instructions, BASIC and assembler messages and codes, branch instructions, BASIC facts, data alteration instructions, reserved words, I/O instructions, ROM routines, complete character chart with graphics and space-compression codes, hex-dec chart, control code cross-reference, assembler instructions, commands and operators, screen line layout, editor commands and subcommands, condition code easy access.

Plus—"magic graphics number"—a mystery until you learn how to use it!

Designed as a fold-up, accordion-style card, fits in your pocket. Panels organized for optimum speed for reference.

Model I: BASIC and Assembler FC1002	\$4.95
Model II: BASIC and Assembler FC1005	\$5.95
Model III: BASIC and Assembler FC1010	\$3.95
Color: BASIC and Extended FC1005	\$5.95
Z-80: Microprocessor FC1011	\$4.95
ZX80, ZX81 and Timex Sinclair 1000: FC1012	\$5.95
Pocket Computer: BASIC FC1009	\$2.95
Apple II and Apple II Plus: BASIC and 6502 FC1008	\$4.95
Apple II and Apple II Plus: BASIC only FC1007	\$3.95

TRS-80 COLOR BASIC—Bob Albrecht. Learn how to use the unique color, sound and graphics of the TRS-80 Color Computer. This self-teaching guide uses a learn-as-you-play format to teach Color BASIC. Packed with games, experiments, programming problems, and solutions, it is an ideal introduction for children, teachers, and adults. It starts with simple concepts and takes you on to more complicated games, graphics, and activities, including many chances for you to try out your newly learned programming skills. Included is an entire chapter on programming problems, which offers tips on adapting to Microsoft BASIC on other personal computers. BK1280 \$10.95

PROGRAMMING THE 6809—by Rodney Zaks and William Labiak. This book explains how to program the 6809 in assembly language, covering all aspects progressively and systematically: basic programming techniques and devices, application examples, data structures, and program development. No prior programming knowledge is required. BK1264 \$15.95

TRS-80 COLOR COMPUTER GRAPHICS—by Don Inman with DYMAX. This exciting book will enable you to explore all the graphics capabilities of Extended Color BASIC. You'll learn how to create interesting graphics to enhance your own computer programs. Also included are application programs and subroutines that will be invaluable when you begin writing your own graphics programs. Each chapter ends with a summary and practice exercises. BK1266 \$14.95

ASSEMBLY LANGUAGE GRAPHICS FDR TNE TRS-80 COLOR COMPUTER—by Don Inman and Kurt Innen with DYMAX. This dynamic new book uses sound and graphics to show you how 6809 assembly language can be used to perform tasks that would be difficult or impossible with BASIC. All of the techniques are explained in a hands-on approach. Learn how to tailor your own programming style, from editing, assembling, executing and even debugging, to making your own programs run quickly and efficiently. It is also packed with video screen diagrams which explain each step of the process of creating your own graphics. BK1277 \$22.95

6809 MICROCOMPUTER PROGRAMMING AND INTERFACING—by Andrew C. Steagard, Jr. Getting involved with Tandy's new Color Computer? If so, this new book from the Blacksburg Group will allow you to exploit the awesome power of the machine's 6809 microprocessor. Detailed information on processor architecture, addressing modes, register operation, data movement, arithmetic logic operations, I/O and interfacing is provided, as well as a review section at the end of each chapter. Four appendices are included covering the 6809 instruction set, specification sheets of the 6809 family of processors, other 6800 series equipment, and the 6809/6802 Peripheral Interface Adapter. This book is a must for the serious Color Computer owner. BK1215 \$13.95.

BASIC & PASCAL

LEARNING TRS-80 BASIC—by David A. Lien. Dr. Lien, who is the author of THE BASIC HANDBOOK and the original Radio Shack LEVEL I USER'S MANUAL, has compiled a tutorial which includes portions of the original USER'S MANUAL, and most of LEARNING LEVEL II along with extensive additions. It will completely cover the TRS-80 Models I, II, III, and 16 (sorry, not the color or pocket computers). It is, of course, written in the easy learning style which readers of Dr. Lien's books have come to enjoy. BK1175 \$19.95.

THE BASIC HANDBOOK—SECOND EDITION—by David Lien. This book is unique. It is a virtual ENCYCLOPEDIA of BASIC. While not favoring one computer over another, it explains over 250 BASIC words, how to use them and alternate strategies. If a computer does not possess the capabilities of a needed or specified word, there are often ways to accomplish the same function by using another word or combination of words. That's where the HANDBOOK comes in. It helps you get the most from your computer, be it a "bottom-of-the-line" micro or an oversized monster. BK1174 \$19.95.*

PROGRAMMING IN PASCAL—by Peter Grogono. The computer programming language PASCAL was the first language to embody in a coherent way the concepts of structured programming, which has been defined by Edsger Dijkstra and C.A.R. Hoare. As such, it is a landmark in the development of programming languages. PASCAL was developed by Niklaus Wirth in Zurich; it is derived from the language ALGOL 60 but is more powerful and easier to use. PASCAL is now widely accepted as a useful language that can be efficiently implemented, and as an excellent teaching tool. It does not assume knowledge of any other programming language and therefore suitable for an introductory course. BK1140 \$12.95.*

INTRODUCTION TO PASCAL—by Rodney Zaks. A step-by-step introduction for anyone wanting to learn the language quickly and completely. Each concept is explained simply and in a logical order. All features of the language are presented in a clear, easy-to-understand format with exercises to test the reader at the end of each chapter. It describes both standard PASCAL and UCSD PASCAL, the most widely used dialect for small computers. No computer or programming experience is necessary. BK1189 \$16.95

For Toll Free Ordering Call 1-800-258-5473

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Dealers . . .

Selling 80 Micro will make money for you. Consider the facts:

Fact #1: Selling 80 Micro increases store traffic—our dealers tell us that 80 Micro is the hottest-selling computer magazine on the newsstands.

Fact #2: There is a direct correlation between store traffic and sales—increase the number of people coming through your door and you'll increase sales.

Fact #3: Fact #1 + Fact #2 = INCREASED \$ALE\$, which means more money for you. And that's a fact.

For information on selling 80 Micro, call 800-343-0728 and speak with Ginnie Boudrieau, our bulk sales manager. Or write to her at 80 Micro, 80 Pine St., Peterborough, NH 03458.

80micro™

80 Pine Street Peterborough, NH 03458
800-343-0728

**MAKE IT
EASY
TO
SAVE
your copies of
80micro**

Your magazine library is your prime reference source—keep it handy and keep it neat with these strong library shelf boxes. They are made of white corrugated cardboard and are dust resistant. Use them to keep all your magazines orderly yet available for constant reference.

Self-sticking labels are available for the following:

80 Micro	73 Magazine	Radio Electronics
Microcomputing	QST	Personal Computing
inCider	CQ	Byte
Desktop Computing	Ham Radio	Interface Age

One box (BX1000) is \$2.00, 2-7 boxes (BX1001) are \$1.50 each, and 8 or more boxes (BX1002) are \$1.25 each. Be sure to specify which labels we should send.

Call TOLL-FREE for credit card orders:
1-800-258-5473

Or use the order form in this magazine and mail to:

80micro™

Attn: Book Sales, Peterborough, NH 03458

SHIPPING AND HANDLING CHARGES \$2.00 per order up to and including a quantity of eight 25¢ for each additional box ordered.

NEW SUMMER TIME SPECIAL NEW SUMMER TIME SPECIAL

SUPDUP 3.0¹

Duplicate SU+² In STANDARD /CMD format.
No need for expensive backup disks!

- Keep a SU+ backup on your system disk — always ready when you need it!
- Enter SU+ with high memory unaltered! Pass data back and forth between SU+ and other programs. Load a high memory monitor and jump to it after SU+ loads!
- No machine language knowledge required! SUPDUP does all the work!
- Works with SU+ versions 2.2z, 2.2P, 3.1 and 3.1a!

If you own Super Utility Plus² you need SUPDUP 3.0¹!

- SUPDUP 3.0¹ is provided on unprotected disk with users manual for the Model I or III.

NOW \$15.95

Add \$2 P & H
Overseas Add \$5



✓337



1302 - 41st Street • Orlando, Florida 32805
TO ORDER

Send Check or Money Order. Credit Card orders include acct. number and exp. date or call TOLL FREE 1-800-327-4459. FLA. residents or technical queries call 1-305-423-5683. FLA. orders add 5% sales tax.

Purchase orders must include pre-payment.

This product is for your personal use only. Not meant for distribution or sale.
1. *WittSoft 2. *Breeze/QSD, Inc.

NEW SUMMER TIME SPECIAL NEW SUMMER TIME SPECIAL

GET AN EAR-FULL



Teach yourself music theory. Become an expert at identifying melodic intervals. Everything you need is in Music Tescher, a two-part educational program.

Music Theory—Learn staff and bar lines, treble and bass clefs, the grand staff, time signatures, rests, notes, and major scales.

Ear Trainer—Improve your listening skills. Teach yourself to identify musical intervals by hearing them as often as you like. You'll never find a more patient teacher.

Become a musical expert with Music Tescher. Ideal for teachers and students.

TRS-80* Models I & III (Level II), or PMC* computer. 0300RD, disk, sound, light pen optional, 32K, \$19.95. 0059R, tape, sound, light pen optional, 16K, \$14.95.

*TRS-80 is a registered trademark of Radio Shack, a division of Tandy Corp.
*PMC is a registered trademark of Personal Microcomputers Inc.

✓595

Yes! Send me _____ copies of Music Teacher (tape)@\$14.95.
_____ copies of Music Teacher (disk)@\$19.95.

Please add \$2.50 postage & handling.

VISA MC AE Check/MO

name _____

address _____

city _____ state _____ zip _____

card# _____ exp. date _____

signature _____

Instant Software CALL 1-800-258-5473 to order 3398BM

Instant Software • Rt. 101 & Elm St. • Peterborough NH 03458



Model 100 Conversions: Easy as I, II, III

by Beve Woodbury
80 Micro Technical Editor

You can convert many Model I, II, and III programs for the Model 100 with few modifications. In fact, some programs don't require any changes. This article will help you choose and convert programs appropriate for the Model 100.

What to Avoid

Avoid programs that require direct access (disk) file input and output. As of now, the 100 offers only sequential file input and output. Since Model 100 programs and files are stored within the computer, your 100's memory size limits the size of the programs and files you can use.

Also avoid programs that use POKEs and PEEKs. If you're not familiar with machine language and the Model 100's memory map, these commands may give you some strange results.

Finally, avoid programs that require large screen displays such as game graphics. You can alter screen displays for the Model 100 providing you keep in mind the limitations imposed by the 40-character by 8-line display. Change any Print@ statements in your conversion so that it prints at the correct location on your 100.

A Sample Program

Math Program is a Model I/II/III program that I converted to run on the Model 100 as a conversion example (see Program Listing 1).

Once you boot up the program, enter your name and choose from a menu to add, subtract, multiply, divide, or quit. When you choose the function you want, you're given the option of Level 1 (for numbers 0-9) or Level 2 (for numbers 0-100).

The program uses random numbers in the math problems. It prints the problem on the screen and waits for your answer. If you answer correctly, the computer tells you so; if you're wrong, the screen displays **WRONG** along with the correct answer.

When you quit the program, it reads an input sequential file to see if your name exists in the file. If it does, the program

prints the scores you achieved last time along with your current scores. Scores are calculated for each math function as well as overall.

Your current scores replace your old scores on the output sequential file or, if you aren't already on the file, the program adds your name and scores to the end of the output file.

Establishing Files

Prior to running Math Program on any TRS-80, you must enter Basic with two files and an established sequential input file.

On Models I/II/III, enter Basic by typing BASIC - F:2. To establish the sequential input file for Math Program, type in:

OPEN "O",1,"SCORES":CLOSE

and press the enter key.

On the Model 100, the command Maxfile=2 in line 10 opens the Basic file channels. Enter the text mode to establish the sequential input file. When the screen prints "File to edit?", type SCORES, press the enter key, and then press the Model 100's F8 key.

You only need to establish the Scores file before the program's first run or when the Scores file has been killed.

Model 100 Math Program Changes

Program Listing 2 is Math Program converted for the Model 100. Compare the two programs. I'll explain what changes were made and why. I have kept the line numbers the same in both programs for easy comparison.

Remark Statements

Remark statements, indicated by REM or an apostrophe, help you understand and debug a program. They illustrate the program's flow, explain what's being done in certain areas of the program, and help locate problem areas. Remarks also define a particularly confusing or unusual command area.

Each character or space in a remark statement takes up 1 byte of memory. Because of the Model 100's memory limitation, it is advisable to remove all spaces and remark statements from the program. But you should keep a printed copy of the complete program for future reference in making changes, debugging, or understanding program flow.

GOTO and GOSUB Statements

Programmers sometimes have GOTO or GOSUB statements reference a remark statement that explains a routine that follows. When you remove REM lines, be sure to change the line number in any GOTO or GOSUB statement that references the deleted remark line number to the correct number. See program lines 390 and 810. If you miss one of these corrections, you'll get an undefined line error (UL).

Altering the Display Command

Print @ statements require the most changes (see lines 290-360 in Listing 1). You have to modify print locations from a

The Key Box

"Model 100 Conversions: Easy as I, II, III" applies to any Model 100. "Disassembler," "Elapsed Time," and "If It's Tuesday..." all require 8K RAM.

64-character by 16-line format (Model I/III) or an 80-character by 23-line format (Model II) to the Model 100's format. Map the necessary changes by plotting the print locations on the 100's screen graph paper (p. 210 in the Model 100 manual) or by trial and error. The 100's screen limitation may make many programs unusable or unpleasant when converted.

If you have many lines of print that don't fit on the eight lines available, you'll want to control the speed of the screen scroll. You can accomplish this with For...Next loops every eight lines. I prefer to use an INKEY\$ routine (line 270) that allows the user to go to the next screen at his own rate by pressing any key.

Opening Files

Model 100 commands to open files are different from those

Program Listing 1. Math Program for Models I, II, and III.

```

10  ****
20  *
30  *      MATH PRACTICE
40  *      by Beve Woodbury
50  *
60  ****
70
80
90
100 CLS
110 ON ERROR GOTO 1140
120 FS="     .##      .##      .##      .##      .##"
130 REM          beginning screen
140 PRINT# 215, "MATH PRACTICE"
150 PRINT# 723, "TYPE YOUR NAME, PLEASE."
160 PRINT# 855, "
170 INPUT NS
180 CLS
190 PRINT "You will now have a chance to practice your math.
200 PRINT
210 PRINT "You may choose what math function you want to practice
e then I will choose some number problems for you to solve.
220 PRINT
230 PRINT "I will keep score of how many problems you get right
and how many you get wrong. When you QUIT, I will tell you your score."
240 PRINT
250 PRINT "I will also tell you if you did better than the last
time you practiced."
260 PRINT# 845, "Press ANY key to continue."
270 IS=INKEY$:IF IS="" THEN 270
280 REM          print math menu
290 CLS
300 PRINT#153,"MENU"
310 PRINT#340,"1. ADD"
320 PRINT#404,"2. SUBTRACT"
330 PRINT#468,"3. MULTIPLY"
340 PRINT#532,"4. DIVIDE"
350 PRINT#596,"5. QUIT"
360 PRINT#833,"PRESS NUMBER OF MATH FUNCTION WANTED, THEN PRESS
THE ENTER KEY"
370 PRINT#920," ";:INPUT F
380 IF F$=5 THEN 290
390 IF F=5 THEN 750
400 T=T+1
410 CLS:PRINT:PRINT
420 PRINT "    LEVEL 1    numbers 0 to 9"
430 PRINT
440 PRINT "    LEVEL 2    numbers 0 to 100"
450 PRINT:PRINT
460 INPUT "PRESS 1 OR 2 THEN PRESS THE ENTER KEY";L
470 IF L>2 THEN 410
480 CLS:ON L GOTO 500, 530
490 REM          get level 1 random numbers for problem
500 A=RND(9)
510 B=RND(9)
520 GOTO 550
530 A=RND(100)
540 B=RND(100)
550 ON F GOTO 570,620,670,710
560 REM          addition
570 CLS
580 PRINT#400, A+"B"="";:INPUT C
590 IF C=A+B THEN AR=AR+1:GOTO 1120
600 PRINT# 530, A+"B"="A+B:AW=AW+1:GOTO 1130
610 REM          subtraction
620 IF B>A THEN H=A:A=B:B=H'verify minuend larger number
630 PRINT#400, A "-B"="";:INPUT S
640 IF S=A-B THEN SR=SR+1:GOTO 1120
650 PRINT#530, A "-B"="A-B:SW=SW+1:GOTO 1130
660 REM          multiplication
670 PRINT#400, A **"B"="";:INPUT M
680 IF M=A*B THEN MR=MR+1:GOTO 1120
690 PRINT#530, A **"B"="A*B :MW=MW+1:GOTO 1130
700 REM          division

```

Listing 1 continued in next column

Listing 1 continued from previous column

```

710 OV=A*B           'verify even division
720 PRINT#400, DV"/"B"="";:INPUT D
730 IF D=DV/B THEN :DR=DR+1:GOTO 1120
740 PRINT# 530, DV"/"B"="DV/B: DW=DW+1:GOTO 1130
750 REM          ending routine
760 REM          read old and write new file
770 OPEN "I",1,"SCORES"
780 OPEN "O",2,"NWSCORE"
790 IF EOF(1) THEN 930
800 INPUT#1, NL$,A1,A2,S1,S2,M1,M2,D1,D2,T1
810 IF NL$=NS THEN 840
820 PRINT#2, NL$";";A1,A2,S1,S2,M1,M2,D1,D2,T1
830 GOTO 790
840 REM          get old score
850 PA=A1/(A1+A2)
860 PS=S1/(S1+S2)
870 PM=M1/(M1+M2)
880 PD=D1/(D1+D2)
890 PT=(A1+S1+M1+D1)/T1
900 GOSUB 1100           ' write new score to file
910 Y=1:GOTO 790
920 REM          get new percentage scores
930 NA=AR/(AR+AW)
940 NS=SR/(SR+SW)
950 NM=MR/(MR+MW)
960 ND=DR/(DR+DW)
970 NT=(AR+SR+MR+DR)/T
980 REM          print scores
990 CLS:PRINT:PRINT
1000 PRINT#153,NS
1010 PRINT:PRINT
1020 PRINT"          ADD      SUB      MULT      DIV
TOTAL"
1030 PRINT
1040 IF Y=0 THEN GOSUB 1100:GOTO 1070
1050 PRINT "OLD    ";:PRINT USING F$;PA,PS,PN,PD,PT
1060 PRINT
1070 PRINT "NEW    ";:PRINT USING F$;NA,NS,NM,ND,NT
1080 PRINT:PRINT
1090 CLOSE:KILL "SCORES":CMD"RENAME NWSCORE SCORES":END
1100 PRINT#2,NS";";AR,AW,SR,SW,MR,MW,DR,DW;T
1110 RETURN
1120 PRINT#530, "RIGHT":GOTO 260
1130 PRINT#420, "WRONG":GOTO 260
1140 IF ERR/2+1=11 THEN RESUME NEXT 'continue if /0 error

```

A	Random number—addend, minuend, multiplicand, or quotient
AR	Total of correct additions
AW	Total of wrong additions
B	Random number—addend, subtrahend, multiplier, or divisor
C	Sum in addition
D	Quotient in division
DR	Total of correct divisions
DV	Dividend in division
DW	Total of wrong divisions
F	Math function choice
F\$	Print format string
H	Hold variable for making minuend larger than subtrahend
IS	Inkey variable
L	Level wanted
M	Product in multiplication
MR	Total of correct multiplications
MW	Total of wrong multiplications
NS	Player's name
NA	New addition percentage
ND	New division percentage
NM	New multiplication percentage
NS	New subtraction percentage
NT	New total percentage
NI\$	Name in file
PA	Old addition percentage
PD	Old division percentage
PS	Old subtraction percentage
PT	Old total percentage
S	Difference in subtraction
SR	Total of correct subtractions
SW	Total of wrong subtractions
T	Total of problems attempted

Table 1. Math Program variable list.

of the other TRS-80s (lines 770 and 780). These commands must appear as shown in Listing 2. Spaces can be inserted between words if desired. Refer to p. 165 in the Model 100 manual for a more detailed explanation of opening files.

Random Numbers

The Model 100's random number generator returns numbers between 0 and 1. Therefore, all random numbers are decimal numbers to 14 places. The program produces whole numbers by multiplying the decimal numbers generated (line 1520 in Listing 2).

The random numbers are not truly random, however, as the same number sequence is generated each time a program runs. The Model 100 manual provides a short program on p. 175 that ties the random number generator to real time. This produces a different number sequence for each program execution (lines 1500–1510 in Listing 2).

Other Conversion Problems

I am aware of two other problems not demonstrated in Math Program. You must include the Then in an If...Then...GOSUB statement. You cannot use If...GOSUB as you can on the Model 111. But in an If...Then...GOTO statement, either the Then or the GOTO can be left out.

Character strings (CHR\$) 32–125 are the same on all TRS-80s. Any other character string may or may not be different on the 100 and must be checked carefully to determine the appropriate CHR\$ command for the Model 100.

More Changes?

This covers the changes I've found necessary in converting programs to the Model 100. Give it a try and if you come across any others, let me know about them and I'll include them in a future issue. ■

Program Listing 2. Math Program for the Model 100.

```

10 MAXFILES=2
100 CLS
110 ONERRORGOTOL140
120 F$="#.# #.## #.## .##"
140 PRINT@92,"MATH PRACTICE
150 PRINT@167,"TYPE YOUR NAME, PLEASE.
160 PRINT@254,"";:INPUT NS
210 CLS:PRINT"Choose the math function
you want.
220 PRINT"I will print number problems
to solve.
230 PRINT:PRINT"When you quit, I will
print your scores and your last scores.
260 PRINT@243,"Press ANY key to
continue.
270 I$=INKEY$:IFI$=="THEN270
290 CLS:PRINT@56,"1. ADD
320 PRINT@96,"2. SUBTRACT
330 PRINT@136,"3. MULTIPLY
340 PRINT@176,"4. DIVIDE
350 PRINT@216,"5. QUIT
360 PRINT@280,"ENTER NUMBER OF MATH
FUNCTION WANTED";:INPUTF
380 IFF>5THEN290
390 IFF=5THEN770
400 T=T+1

```

```

410 CLS:PRINT:PRINT"      LEVEL 1
numbers 0 to 9
430 PRINT:PRINT"      LEVEL 2      numbers 0
to 100
460 PRINT:PRINT"ENTER LEVEL SELECTION 1
OR 2 ":";INPUTL
470 IFL>2THEN410
480 CLS:ONLGOTO500,530
500 GOSUB1500:A=X1:GOSUB1500:B=X1
520 GOTO550
530 GOSUB1500:A=X2:GOSUB1500:B=X2
550 ONFGOTO570,620,670,710
570 CLS:PRINT@95,A+"B";:INPUTC
590 IFC=A+BTHENAR=AR+1:GOTOL120
600 PRINT@175,A+"B"="A+B:AW=AW+
1:GOTOL130
620 IFB>ATHENH=A:A=B:B=H
630 PRINT@95,A"-B";:INPUTS
640 IFS=A-BTHENS=SR+1:GOTOL120
650 PRINT@175,A"-B"="A-B:SW=SW+
1:GOTOL130
670 PRINT@95,A**B";:INPUTM
680 IFM=A*BTHENMR=MR+1:GOTOL120
690 PRINT@175,A**B"=A*B:MW=MW+
1:GOTOL130
710 DV=A*B:IFB=0THENB=1
720 PRINT@95,DV"/B";:INPUTD
730 IFD=DV/BTHENDR=DR+1:GOTOL120
740 PRINT@175,DV"/B"=DV/B:DW=DW+
1:GOTOL130
770 OPEN"RAM:SCORES.DO"FORINPUTAS1
780 OPEN"RAM:NWSCOR.DO"FOROUTPUTAS2
790 IFEEOF(1)THEN930
800 INPUT#1,N1$,A1,A2,S1,S2,M1,M2,
D1,D2,T1
810 IFN1$=N$THEN850
820 PRINT#2,N1$;";A1,A2,S1,S2,M1,M2;
D1;D2,T1
830 GOTO790
850 PA=A1/(A1+A2)
860 PS=S1/(S1+S2)
870 PM=M1/(M1+M2)
890 PT=(A1+S1+M1+D1)/T1
900 GOSUB1100
910 Y=1:GOTOL100
930 NA=AR/(AR+AW)
940 NS=SR/(SR+SW)
950 NM=MR/(MR+MW)
960 ND=DR/(DR+DW)
970 NT=(AR+SR+MR+DR)/T
990 CLS:PRINT@10,NS
1020 PRINT@88,"ADD      SUB      MULT      DIV
TOTAL
1040 IFY=0THENGOSUB1100:GOTOL070
1050 PRINT"OLD
";:PRINTUSINGF$;PA,PS,PM,PD,PT:PRINT
1070 PRINT"NEW
";:PRINTUSINGF$;NA,NS,NM,ND,NT
1090 CLOSE:KILL"SCORES.DO":
NAME"NWSCOR.DO"AS"SCORES.DO":END
1100 PRINT#2,N$;";AR;AW;SR;SW;MR;MW;
DR;DW;T
1110 RETURN
1120 PRINT@178,"RIGHT":GOTOL260
1130 PRINT@114,"WRONG":GOTOL260
1140 IFERR=11THENRESUMENEXT
1500 S=VAL(RIGHT$(TIME$,2))
1510 FORI=1TO$X=RND(1):NEXT
1520 X1=INT(X*10):X2=INT(X*100):RETURN

```

Disassembler

by David Cloutier

Soon after I got my Model 100, I tried to map its ROM and RAM. I downloaded the two disassemblers on CompuServe to do so, but both were too large to run on an 8K machine. So, I had to write my own program (see Program Listing 3).

Run Listing 3 and enter the memory location you wish to examine. You must enter the location in decimal format. Originally, I wrote the program so you could enter it in either decimal or hexadecimal, but, to conserve memory, I had to remove the subroutine that provided this option.

If your machine has more than 8K, you can reinsert this option by changing line 12520 to:

```
12520 INPUT "Start address (suffix with H if hex)";$S$
```

and adding the lines in Fig. 1.

After the memory location you're interested in is mapped, press the R key to enter another memory location. Or, press the Q key to end the program.

One problem with this disassembler is its length. If you have an 8K machine, you'll probably have to remove all other files in memory or save them to tape. Between each mnemonic and its operand is a tab—there are no spaces.

When the program first runs, it arrives at memory location

```
10500 MSS=LEFT$(S$,2):LSS=RIGHT$(S$,2)
10510 NS=MSS:GOSUBL0610:LM=L:RM=R
10520 NS=LSS:GOSUBL0610
10530 S=LM*16 3+RM*16 2+L*16+R:RETURN
10610 L$=LEFT$(NS,1):IFASC(L$)>57
THENL=(240ORASC(L$))-231:ELSEL=VAL(L$)
10620 R$=RIGHT$(NS,1):IFASC(R$)>57
THENR=(240ORASC(R$))-231:ELSER=VAL(R$)
10630 RETURN
12525 IFLEN(S$)>5THEN12520
12530 IFRIGHT$(S$,1)="H" ORRIGHT$(S$,1)="
h" THENS$=LEFT$(S$,LEN(S$)-1):GOSUBL2700:
GOSUBL0500:ELSES=VAL(S$)
12700 IFLEN(S$)<4THENS$="0"+S$:GOTO12700
:ELSERETURN
```

Figure 1. If your Model 100 has more than 8K RAM, add these lines to the disassembler; they give the option of entering the RAM address in decimal or hexadecimal

Program Listing 3. Disassembler.

```
5 CLEAR70:DIMAS$(256)
10 DATA"NOP","LD      BC,#","LD
(BC),A","INC    BC","INC      B"
20 DATA"DEC      B","LD      B,!","RCLA","EX
AF,AF","ADD    HL,BC","LD      A,(BC)"
30 DATA"DEC      BC","INC      C","DEC
C","LD      C,!","RRCA","DJNZ      @"
```

7D33. This isn't surprising since the first command in memory is JP 7D33. When the program reaches locations 7D37-7D3D, it tests for a time delay. If the check comes back negative, the program sends some numbers to port D3.

As it continues through memory, the disassembler eventually arrives at 7EE1. This subroutine tests the memory size by getting the value of the first memory location of a chip and then complementing the value and loading it back into memory. If a read finds the number is the complement of the original, the memory is RAM and the program checks for any remaining RAM chips (see "Monitor 100," *80 Micro*, July 1983, p. 178 for a memory map).

If the test fails or if all the chips are accounted for, the program loads the beginning location of all RAM into FAC0.

The subroutine 5A7C copies the default labels from ROM into RAM locations F789-F809. Call 6C93 makes a copy of F789-F809 and puts it into F80A-F88A. Call 6C9C does the reverse—it copies the label line in F80A-F88A to F789-F809.

Call 0FE8 retrieves the character in the memory location HL points to; if the character is lowercase, the call converts it to uppercase and returns with the new character in the HL register pair.

Call 2542 is similar to the Z80 command LDIR. It takes the block pointed to by the HL register (block length in register B) and moves it to the memory pointed to by the DE register. ■

Write to David Cloutier at Bullard Road, North Brookfield, MA 01535.

```
40 DATA"LD      DE,#","LD      (DE),A",
"INC    DE","INC      D","DEC D"
50 DATA"LD      D,!","RLA","JR  @","ADD
HL,DE","LD      A,(DE)","DEC      DE"
60 DATA"INC      E","","DEC E","LD      E,!","R
RA","JR  NZ,@","LD      HL,#","LD
(###),HL","INC HL","INC      H"
70 DATA"DEC      H","LD      H,!","DAA","JR
Z,@","ADD      HL,HL","LD      HL,(###)
","DEC HL","INC      L","DEC L"
80 DATA"LD      L,!","CPL","JR  NC,@","L
D      SP,#","LD      (###),A","INC
SP","INC      (HL)","DEC      (HL)"
90 DATA"LD      (HL),!","SCF","JR
C,@","ADD      HL,SP","LD      A,(###)
","DEC SP","INC      A","DEC A"
100 DATA"LD     A,!","CF","LD      B,B","LD
B,C","LD      B,D","LD
B,E","LD      B,H","LD      B,L","LD
B,(HL)
```

```
B,A","LD      C,B","LD
C,C","LD      C,D","LD
C,E","LD      C,H","LD      C,L"
120 DATA"LD     C,(HL)","LD      C,A","LD
D,B","LD      D,C","LD
D,D","LD      D,E","LD      D,H"
130 DATA"LD     D,L","LD      D,(HL)",
"LD      D,A","LD      E,B","LD
E,C","LD      E,D","LD      E,E"
140 DATA"LD     E,H","LD      E,L","LD
E,(HL)","LD      E,A","LD
H,B","LD      H,C","LD      H,D"
150 DATA"LD     H,E","LD      H,H","LD
H,L","LD      H,(HL)","LD
```

Listing 3 continued

Listing 3 continued

```

H,A","LD      L,B","LD      L,C"
160 DATA"LD      (HL),C","LD      (HL),D",
"LD      (HL),E","LD      (HL),H","LD
(HL),L","HALT","LD      (HL),A"
170 DATA"LD      (HL),C","LD      (HL),D",
"LD      (HL),E","LD      (HL),H","LD
(HL),L","HALT","LD      (HL),A"
180 DATA"LD      A,B","LD      A,C","LD
A,D","LD      A,E","LD
A,H","LD      A,L","LD      A,(HL)"
190 DATA"LD      A,A","ADD      A,B","AD
D      A,C","ADD      A,D","ADD
A,E","ADD      A,H","ADD      A,L"
200 DATA"ADD      A,(HL)","ADD      A,A","AD
C      A,B","ADC      A,C","ADC
A,D","ADC      A,E","ADC      A,H"
210 DATA"ADC      A,L","ADC      A,(HL)",
"ADC      A,A","SUB      B","SUB C","SUB
D","SUB E","SUB H","SUB L","SUB (HL)"
220 DATA"SUB      A","SBC A,B","SBC
A,C","SBC      A,D","SBC      A,E","SB
C      A,H","SBC      A,L","SBC
A,(HL)","SBC      A,A"
230 DATA"AND      B","AND C","AND D","AND
E","AND H","AND L","AND (HL)","AND
A","XOR B","XOR C","XOR D","XOR E"
240 DATA"XOR      H","XOR L","XOR (HL)","X
OR      A","OR B","OR C","OR D","OR
E","OR H","OR L","OR (HL)","OR
A"
250 DATA"CP      B","CP C","CP D","CP
E","CP H","CP L","CP (HL)","CP
A","RET NZ","POP BC"
260 DATA"JP      NZ,#","JP      #","CALL
NZ,#","PUSH BC","ADD
A,!","RST      0","RET Z","RET"
270 DATA"JP      Z,#","Unknown","CALL
Z,#","CALL      #","ADC A,!","RST
0","RET NC","POP DE","JP NC,#"
280 DATA"OUT     (!!),A","CALL NC,#","P
USH      DE","SUB      !","RST 10H","RE
T      C","EXX","JP      C,#"
290 DATA"IN      A,(!!),"CALL C,#","Un
known","SBC      A,!","RST 10H","RE
T      PO","POP HL","JP PO,#"
300 DATA"EX      (SP),HL","CALL PO,#","P
USH      HL","AND      !","RST 20H","RE
T      PE","JP (HL)","JP      PE,#"
310 DATA"EX      DE,HL","CALL PE,#","U
nknown","XOR      !","RST 20H","RET
P","POP AF","JP P,#","DI","CALL P,#"
320 DATA"PUSH AF","OR !","RST 30H","RE
T      M","LD SP,HL","JP      M,#","EI
","CALL M,#","Unknown","CP      !","RST
30H"
1000 FORX=0TO255:READAS(X):NEXT
1010 X=0:GOTO12500
1012 IFX>65535ORX<0THEN12520
1015 P=PEEK(X):PA$=CHR$(P)
1020 P$=A$(P):ML=X:GOSUB12000
1025 GOSUB1700
1030 P$=ML$+CHR$(9)+P$
1040 IFRIGHT$(P$,1)="!"THENGOSUB11000
1050 IFRIGHT$(P$,1)="#"THENGOSUB11500
1055 IFRIGHT$(P$,1)="@"THENGOSUB1500
1060 GOSUB1900:PRINTPS;TAB(25);PA$

```

```

1065 I$=INKEY$:IFI$="r"ORI$="R"THEN12520
1070 X=X+1:GOTO1012
1500 P$=LEFT$(P$,LEN(P$)-1):X=X+1:C=PEEK
(X):PA$=PA$+CHR$(C):IFC>127THENC=C-256
1520 ML=X+1+C:GOSUB12000:P$=P$+ML$:RETUR
N
1700 IFP<>34ANDP<>50THEN1720ELSEGOSUB180
0
1710 MID$(P$,5,4)=P2$+P1$:RETURN
1720 IFP=42THENGOSUB1000:MID$(P$,8,4)=P2
$+P1$:RETURN
1740 IFP=58THENGOSUB1000:MID$(P$,7,4)=P2
$+P1$:RETURN
1760 IFP=211THENX=X+1:P=PEEK(X):PA$=PA$+
CHR$(P):C=P:GOSUB10000:P1$=C$:MID$(P$,6,
2)=P1$:RETURN
1770 IFP=219THENX=X+1:P=PEEK(X):PA$=PA$+
CHR$(P):C=P:GOSUB10000:P1$=C$:MID$(P$,7,
2)=P1$:RETURN
1800 X=X+2:P1=PEEK(X-1):P2=PEEK(X):PA$=P
A$+CHR$(P1)+CHR$(P2):C=P1:GOSUB10000:P1$=
C$:C=P2:GOSUB10000:P2$=C$:RETURN
1900 FORR=1TOLEN(PA$):IFASC(MID$(PA$,R,1
))<32THENMID$(PA$,R,1)="-"
1910 NEXTR:RETURN
10000 HS="#0123456789ABCDEF"
10010 L=INT(C/16):R=C-L*16
10020 CS=MID$(HS,L+1,1)+MID$(HS,R+1,1)
10030 RETURN
11000 P$=LEFT$(P$,LEN(P$)-1)
11010 X=X+1:C=PEEK(X):PA$=PA$+CHR$(C):GO
SUB10000
11020 P$=P$+C$:RETURN
11500 P$=LEFT$(P$,LEN(P$)-1)
11510 X=X+2:C=PEEK(X):P2$=CHR$(C):GOSUB1
0000
11520 P$=P$+C$:C=PEEK(X-1):PA$=PA$+CHR$(C
)+P2$:GOSUB10000
11530 P$=P$+C$:RETURN
12000 MS=INT(ML/256):LS=ML-MS*256
12010 C=MS:GOSUB10000:ML$=CS
12020 C=LS:GOSUB10000:ML$=ML$+CS
12030 RETURN
12500 CLS
12520 INPUT"Start address";S
12550 X=S:GOTO1012

```

Elapsed Time

by Richard Ramella

The Model 100 command PRINT TIME\$ displays the current time in 24-hour, military format, but the time is embedded in a data string and can't be easily substituted in mathematical equations. Elapsed Time (Program Listing 4) solves this problem by letting you use the enter key to mark start and end times of a program and telling you how much time passes between the two.

I used Elapsed Time as a subroutine in programs. It's helpful when I'm trying to pare the running time of a new program, but it can time any event that lasts fewer than 24 hours. The program has various applications, but since the machine

only states times to the second, it isn't useful for timing events that require split-second accuracy.

The program calculates the hours, minutes, and seconds of start and end times, stores them in separate number variables, and then subtracts the start time from the end time. Remember that the decimal system is not useful when working in 60-second, 60-minute, and 24-hour units.

Running the Program

The program begins with this prompt: "To start, tap enter." Hitting the enter key sets the start time. Another prompt then appears: "Timing has begun. To end, tap enter." This second tap stops the program timer. Then the start time, the end time, and the elapsed time are given in this format: 2 hours 23 minutes 1 second.

How It Works

Lines 150 and 200 set A\$(1) and A\$(2) as start and end times. The For...Next loop in lines 240-280 isolates the hour, minute, and second totals of the start and end times and assigns their variable values. This is done using the LEFT\$, MID\$, and RIGHT\$ string commands to isolate the correct two characters for hours, minutes, and seconds, then transforming these into numbers with the VAL command.

Here's an example of how this works:

```
10 Z$ = "4"
20 W = VAL(Z$)
30 PRINT W
```

Line 30 produces the number 4, which is subject to normal mathematical computation on the computer. This example won't work if, for instance, line 10 reads Z\$ = "four".

The reverse of this process is STR\$:

```
10 W = 4
20 Z$ = STR$(4)
30 PRINT Z$
```

Line 30 prints a 4 again, but it's a string 4 and subject to string variable rules.

Elapsed Time changes parts of a string into numbers. These numbers are dealt with in lines 330-380. I won't explain all these lines, but I'll translate one.

In effect, line 330 (in Listing 4) says: If the start- and end-seconds numbers are equal, zero seconds is the answer, so go to the next line. If the end number is higher than the start number, the number of elapsed seconds is the end number minus the start number. The only other possibility is that the start number is bigger than the end number, so the elapsed time number for seconds has to be 60 seconds minus the start number plus the end number. If this is the case, you must borrow the 60 seconds from the minute number.

The minute and hour figures are handled in roughly the same manner. Lines 360-370 print the elapsed time. If no hours or minutes have passed, the program doesn't print "0 hours 0 minutes." But, Elapsed Time does pay attention to plurals and adds an S to the words hour, minute, and second if needed.

In using this routine as a timer for a program in progress, I include program lines to set the value of A\$(1) as the timed routine begins and to set the value of A\$(2) when it is complete. Then I send the test to lines 240-380; the lines in Elapsed

Time are renumbered higher than the lines at the end of the program being timed, so no significant overlap exists. Once the elapsed time is stated, you can go back to the timed program to try to shorten its run time. ■

Write to Richard Ramella at 1493 Mt. View Ave., Chico, CA 95926.

```
100 REM * Elapsed Time * TRS-80 Model
100 * Richard Ramella *
110 CLS
130 PRINT "To start, tap Enter."
140 INPUT X
150 A$(1)=TIME$
160 CLS
170 PRINT "Timing has begun."
180 PRINT "To end, tap Enter."
190 INPUT X
200 A$(2)=TIME$
230 CLS
240 FOR A=1 TO 2
250 H(A)=VAL(LEFT$(A$(A),2))
260 M(A)=VAL(MID$(A$(A),4,2))
270 S(A)=VAL(RIGHT$(A$(A),2))
280 NEXT A
290 PRINT "Start: ";A$(1)
300 PRINT "Finish: ";A$(2)
310 PRINT STRING$(20,"-")
320 PRINT "Elapsed time..."
330 IF S(1)=S(2) THEN 340 ELSE IF S(2)>S(1) THEN S(3)=S(2)-S(1) ELSE S(3)=(60-S(1))+S(2):M(3)=-1
340 IF M(2)=M(1) THEN 350 ELSE IF M(2)>M(1) THEN M(3)=M(3)+(M(2)-M(1)) ELSE M(3)=M(3)+(60-M(1))+M(2):H(3)=-1
350 IF H(2)=H(1) THEN 360 ELSE IF H(2)>H(1) THEN H(3)=H(3)+(H(2)-H(1)) ELSE H(3)=H(3)+(24-H(1))+H(2)
360 IF H(3)>0 THEN PRINT H(3)"hour";:
IF H(3)>1 THEN PRINT "s ";
370 IF M(3)>0 THEN PRINT M(3)"minute";:
IF M(3)>1 THEN PRINT "s";
380 IF S(3)>0 THEN PRINT S(3)"second";:
IF S(3)>1 THEN PRINT "s"
390 END
```

Program Listing 4. Elapsed Time.

If It's Tuesday . . .

Conversion by Mare-Anne Jarvela
80 Micro Technical Editor

You may have noticed that your corner liquor store stocks your favorite brands in half-liters instead of those familiar fifths and pints. And it's just as likely that the local service station now dispenses gas in liters rather than gallons. Despite these minor concessions to metric conversion, the United States, for the most part, stands apart in a world of kilometers, liters, and grams.

But if travel or business takes you abroad, or even across the border to Canada or Mexico, you may need to convert

U.S. measurements and currency into metric equivalents and foreign monies and back again. Conv.BA does all the hard work (see Program Listing 5).

Measurement Conversions

After boot-up, the program displays the menu shown in Fig. 2. If you choose option 1 or 2, conversions between U.S. and metric measurements, a new menu appears and you choose the conversion you want to make (see Fig. 3). For example, you can convert inches to centimeters or liters to gallons.

After this, enter the number you want converted and the answer appears on the screen. You can then return to the main menu for another conversion.

Currency Conversion

If you select Foreign Currency from the main menu, a submenu displays two options: to convert U.S. dollars into foreign currency or vice versa.

If you choose to convert U.S. dollars to a foreign currency, the program displays seven countries and their monetary denominations in parentheses (see Fig. 4). Select the country/currency of interest.

After you select the exchange, the program prompts you for

the current currency exchange rate. For instance, if you wanted to convert dollars into French currency, the program asks you the exchange rate for one franc. You'll find exchange rates in the financial section of your local newspaper or *The Wall Street Journal* under the heading "U.S. \$ Equivalents."

When you enter the exchange rate, the program prompts for the number of dollars you want converted. When the answer appears, you can return to the main menu.

If you want to convert foreign currency to U.S. dollars, you would choose option 2 from the submenu. When you choose the currency to which you want your dollar figure converted, the program prompts, "What is the current exchange rate for one U.S. dollar?" Again, this information is found in your newspaper's financial section, under "Currency per U.S. \$." Enter the appropriate number, then enter the number of dollars you want converted and your answer appears on the display.

If for any reason you want to change the calculations for figuring out the currency, alter lines 1040 and 1100.

Bon Voyage

Have fun converting and don't leave home without your Model 100. Hopefully this program will help you the next time you buy gas by the liter at a German service station. ■

1. U.S. STANDARD→METRIC
 2. METRIC→U.S. STANDARD
 3. FOREIGN CURRENCY
- ENTER 1, 2 OR 3?

Figure 2. Conv.BA's main menu.

1. FAHRENHEIT TO CELSIUS
 2. INCHES TO CENTIMETERS
 3. FEET TO METERS
 4. MILES TO KILOMETERS
 5. OUNCES TO GRAMS
 6. POUNDS TO KILOGRAMS
 7. GALLONS TO LITERS
- ENTER NUMBER OF CONVERSION?

Figure 3. Menu to convert U.S. measurements to foreign measurements.

1. CANADA (DOLLAR)
 2. BRITAIN (POUND)
 3. FRANCE (FRANC)
 4. MEXICO (PESO)
 5. W. GERMANY (MARK)
 6. SPAIN (PESETA)
 7. JAPAN (YEN)
- ENTER NUMBER OF CURRENCY?

Figure 4. Currency conversion options.

Program Listing 5. Conv.BA.

```

10 REM CONVERSION
20 CLS:PRINT"1. U.S. STANDARD
";:PRINTCHR$(154);:PRINT" METRIC"
30 PRINT:PRINT"2. METRIC ";:PRINTCHR$(154);:PRINT" U.S. STANDARD"
40 PRINT:PRINT"3. FOREIGN CURRENCY"
50 PRINT:INPUT"ENTER 1,2 OR 3";N
60 IF N=1 GOTO90
70 IF N=2 GOTO 210
80 IF N=3 GOTO890 ELSE 20
90 CLS:PRINT"1. FARENHEIT TO CELSIUS"
100 PRINT"2. INCHES TO CENTIMETERS"
110 PRINT"3. FEET TO METERS"
120 PRINT"4. MILES TO KILOMETERS"
130 PRINT"5. OUNCES TO GRAMS"
140 PRINT"6. POUNDS TO KILOGRAMS"
150 PRINT"7. GALLONS TO LITERS"
160 INPUT"ENTER NUMBER OF CONVERSION";R
170 ON R GOSUB
330,370,410,450,490,530,570
180 PRINT:INPUT"DO YOU WANT ANOTHER
CONVERSION (Y/N) ";A$
190 IF A$="Y" THEN 20
200 IF A$="N" THEN 1210 ELSE 180
210 CLS:PRINT"1. CELSIUS TO FARENHEIT"
220 PRINT"2. CENTIMETERS TO INCHES"
230 PRINT"3. METERS TO FEET"
240 PRINT"4. KILOMETERS TO MILES"
250 PRINT"5. GRAMS TO OUNCES"
260 PRINT"6. KILOGRAMS TO POUNDS"
270 PRINT"7. LITERS TO GALLONS"
280 INPUT"ENTER NUMBER OF CONVERSION";S
290 ON S GOSUB
610,650,690,730,770,810,850
300 PRINT:INPUT"DO YOU WANT ANOTHER
CONVERSION (Y/N) ";A$

```

Listing 5 continued

How many companies offer
toll free **TOTAL SUPPORT** on
all hardware & software?

There is only one number to call:

1-800-237-8977

In Florida call 1-437-4125

Business Applications Software with
TOTAL SUPPORT... specializing in:
IBM™, APPLE™, TRS-80™ and XEROX™

The Systems Group

2340 State Route 580 / Suite 234
Clearwater, Florida 33575
Telex 701484

There is only one catalog to have:
our new, **free** 100 pages of the
best in hardware and software.
Send for your copy today!

IBM is a trademark of IBM Corporation.
APPLE is a trademark of Apple Computer Inc.
TRS-80 is a trademark of Tandy Radio Shack Division of Tandy Corporation.
XEROX is a trademark of Xerox Corporation.

T	Menu choice	X	Degrees Celsius
N	Menu choice	W	Centimeters
R	Menu choice	E	Meters
S	Menu choice	K	Kilometers
V	Menu choice	G	Grams
D	Degrees Fahrenheit	B	Kilograms
I	Inches	L	Liters
F	Feet	C	Current exchange rate
M	Miles	U	How many units?
O	Ounces	AS	Y/N Input
P	Pounds	BS	Singular currency
Q	Gallons	CS	Plural currency

Table 2. Conv.BA variable list.

Line	Description
10-80	Menu (Main)
90-200	Menu (U.S. Standard to Metric)
210-330	Menu (Metric to U.S. Standard)
340-600	Calculations (U.S. Standard to Metric)
610-880	Calculations (Metric to U.S. Standard)
890-910	Menu (Main-Foreign Currency)
920-1010	Menu (Choice of Currency)
1020-1070	U.S. \$ to Foreign Currency
1080-1130	Foreign Currency to U.S. \$
1140-1200	String Values
1210	End

Table 3. Conv.BA line descriptions.

Listing 5 continued

```

310 IF A$="Y"THEN 20
320 IF A$="N"THEN 1210 ELSE 300
330 REM F TO C
340 CLS:INPUT"DEGREES FARENHEIT";D
350 PRINT:PRINT D;"DEGREES FARENHEIT"
=;"5/9*(D-32); " DEGREES CELSIUS"
360 RETURN
370 REM INCHES TO CENTIMETERS
380 CLS:INPUT"How MANY INCHES";I
390 PRINT:PRINT I;"INCHES =";I*
2.54;"CENTIMETERS"
400 RETURN
410 REM FEET TO METERS
420 CLS:INPUT"How MANY FEET";F
430 PRINT:PRINTF;"FEET =";F*
.3048;"METERS"
440 RETURN
450 REM MILES TO KILOMETERS
460 CLS:INPUT"How MANY MILES";M
470 PRINT:PRINTM;"MILES =";M*
1.609;"KILOMETERS"
480 RETURN
490 REM OUNCES TO GRAMS
500 CLS:INPUT"How MANY OUNCES";O
510 PRINT:PRINTO;"OUNCES =";O*
20.35;"GRAMS"
520 RETURN
530 REM POUNDS TO KILOGRAMS
540 CLS:INPUT"How MANY POUNDS";P
550 PRINT:PRINTP;"POUNDS =";P*
.45;"KILOGRAMS"
560 RETURN
570 REM GALLONS TO LITERS
580 CLS:INPUT"How MANY GALLONS";Q
590 PRINT:PRINTQ;"GALLONS =";Q*
3.8;"LITERS"
600 RETURN
610 REM C TO F
620 CLS:INPUT"How MANY DEGREES
CELSIUS";X
630 PRINT:PRINTX;"DEGREES CELSIUS =";9*X
/5+32;"DEGREES FARENHEIT"
640 RETURN
650 REM CENTIMETERS TO INCHES
660 CLS:INPUT"How MANY CENTIMETERS";W
670 PRINT:PRINTW;"CENTIMETERS =";W*

```

```

.39;"INCHES"
680 RETURN
690 REM METERS TO FEET
700 CLS:INPUT"How MANY METERS";E
710 PRINT:PRINTE;"METERS =";E*
3.28;"FEET"
720 RETURN
730 REM KILOMETERS TO MILES
740 CLS:INPUT"How MANY KILOMETERS";K
750 PRINT:PRINTK;"KILOMETERS =";K*
.62;"MILES"
760 RETURN
770 REM GRAMS TO OUNCES
780 CLS:INPUT"How MANY GRAMS";G
790 PRINT:PRINTG;"GRAMS =";G*
.035;"OUNCE"
800 RETURN
810 REM KILOGRAMS TO POUNDS
820 CLS:INPUT"How MANY KILOGRAMS";B
830 PRINT:PRINTB;"KILOGRAMS =";B*
2.2;"POUNDS"
840 RETURN
850 REM LITERS TO GALLONS
860 CLS:INPUT"How MANY LITERS";L
870 PRINT:PRINTL;"LITERS =";L*
0.264;"GALLONS"
880 RETURN
890 CLS:PRINT"1. U.S.$ ";:PRINTCHR$(154)
;:PRINT" FOREIGN CURRENCY":PRINT" (
U.S.$ EQUIVALENT )"
900 PRINT:PRINT"2. FOREIGN CURRENCY
";:PRINTCHR$(154);:PRINT" U.S.$":PRINT"
( CURRENCY PER U.S.$ )"
910 PRINT:INPUT"ENTER 1 OR 2";T
920 CLS:PRINT"1. CANADA (DOLLAR)"
930 PRINT"2. BRITAIN (POUND)"
940 PRINT"3. FRANCE (FRANC)"
950 PRINT"4. MEXICO (PESO)"
960 PRINT"5. W.GERMANY (MARK)"
970 PRINT"6. SPAIN (PESETA)"
980 PRINT"7. JAPAN (YEN)"
990 INPUT"ENTER NUMBER OF CURRENCY";V
1000 ON V GOSUB
1140,1150,1160,1170,1180,1190,1200
1010 IF T=2 THEN 1080
1020 CLS:PRINT"What IS THE CURRENT

```

Listing 5 continued

VIDEO INSTRUCTION TAPES!

HOW MANY HOURS HAVE YOU SPENT READING DOCUMENTATION?

LYNN Computer Service presents a new concept for computer users — The Video Instruction Series. A "REAL TIME" learning aid where the user is shown step by step how to use complicated operating systems and programs. Your VCR, used side by side with your computer, serves as your personal tutor.

**PICTURES ARE WORTH
THOUSANDS OF WORDS AND SAVE
HOURS OF FRUSTRATION**

VIDEO INSTRUCTION SERIES TOPICS:

TRS DOS 1.3 MOD III
TRS DOS 6.0 MOD 4
NEW DOS 80v2.0
LDOS
DOS PLUS 3.5
MULTIDOS

VISICALC
LAZY WRITER
SUPER SCRIPSIT
SCRIPSIT
PROFILE III PLUS

VHS or BETA FORMAT

ONLY **\$39⁹⁵**

EACH TAPE

MASTERCARD — VISA and C.O.D. Orders accepted
add \$3.00 per order for shipping and handling. Telephone
orders taken 9:00 a.m. - 6:00 p.m. Central Time.

Specify either VHS or BETA Tape Format

C.O.D. Orders add \$3.00

TO ORDER PHONE
OR WRITE



LYNN COMPUTER SERVICE

6831 West 157th Street Tinley Park, Illinois 60477

(312) 429-1915

Dealers Inquiries Welcomed

VISICALC IS A TRADEMARK OF PERSONEL SOFTWARE INC. LAZY WRITER IS A TRADEMARK OF ALPHA BIT COMMUNICATIONS SCRIPSIT, SUPERSCRIPSIT, PROFILE, PROFILE, PLUS AND TRSDOS ARE TRADEMARKS OF TANDY CORP. LDOS IS A TRADEMARK OF LOGICAL SYSTEMS INC. NEWDOS80 IS A TRADEMARK OF APPARAT INC. DOS PLUS IS A TRADEMARK OF MICRO-SYSTEMS SOFTWARE INC. MULTIDOS IS A TRADEMARK OF COSMOPOLITAN INC.

THE OLD HARD WAY



THE NEW EASY WAY

Lazy Writer Word Processor AND Video Instruction Tape, a SIMPLE to use WP program POWERFUL enough to design this AD. With documentation and registration card. MOD I, III & 4

ONLY \$150.⁰⁰

Learn to PROGRAM! Level II BASIC for the Model I or III computers. Step by step tutorial lessons on video cassette ...

ONLY \$49⁹⁵

Newdos 80 disk operating system AND video instruction tape, a powerful DOS for the TRS 80 model I or III computers. With documentation and registration card ...

ONLY \$150⁰⁰

Listing 5 continued

```

EXCHANGE RATE FOR 1
":PRINTB$;:INPUT"";C
1030 PRINT:INPUT"How many U.S.$";U
1040 PRINT:PRINTU;"U.S.$ =";:PRINT
  USING"#####.##";U/C;:PRINT" ";C$
1050 PRINT:INPUT"Do you want another
  conversion (Y/N)";A$
1060 IF A$="Y" THEN 20
1070 IF A$="N" THEN 1210 ELSE 1050
1080 CLS:PRINT"** ";C$;" **":INPUT"What
  is the current exchange rate for 1
  U.S.$";C
1090 PRINT:PRINT"How many
  ";:PRINTC$;:INPUT"";U

```

```

1100 PRINT:PRINTU;C$;" =";:PRINT USING
  "#####.##";U/C;:PRINT" U.S.$"
1110 PRINT:INPUT"Do you want another
  conversion (Y/N)";A$
1120 IF A$="Y" THEN 20
1130 IF A$="N" THEN 1210 ELSE 1110
1140 B$="CANADIAN $":C$=B$:RETURN
1150 B$="POUND":C$="POUNDS":RETURN
1160 B$="FRANC":C$="FRANCS":RETURN
1170 B$="PESO":C$="PESOS":RETURN
1180 B$="MARK":C$="MARKS":RETURN
1190 B$="PESETA":C$="PESETAS":RETURN
1200 B$="YEN":C$=B$:RETURN
1210 CLS:END

```

Still Up in the Air

by Eric Grevstad
80 Micro News Editor

From the moment Radio Shack introduced the Model 100, people have considered the portable a suitable seatmate for plane trips. After three months on the market, the 100 has logged a lot of flying time, but still hasn't earned its official license.

Hundreds of owners use their micros, with and without asking permission, on commercial flights. A few ask for permission and are turned down, though, as far as anyone knows, no planes have suffered instrumentation interference or near-disaster as a result of airborne computing. Past that, users waiting for an authoritative yes or no on the 100's airworthiness are still waiting.

As reported in *80 Micro* (July 1983, p. 169), Federal Administration Aviation rule 91-19 outlaws all electric devices except hearing aids, pacemakers, tape recorders, and shavers—unless an airline chooses to allow them. From Model 100 owners' chats on CompuServe, there's no doubt that many airlines are tolerating the 100.

The bulletin board contains dozens of messages like E. Brad Meyer's: "Took Northwest Flight 287 from Boston to Chicago today. Asked permission to use the 100, received it, and used the machine intermittently throughout the flight, including during the final approach. No problems reported."

InfoWorld gave two pages of its June 20 issue to a rather giddy article by Bob Louden of Palo Alto, CA, who played with his new Model 100 from San Francisco to New York and back: "Years ago, a friend told me that you aren't a real success in this country until the stewardesses always stop by to say 'Hello,'" Louden wrote. "You can achieve the same effect with a Model 100, at least until everybody else has one."

Besides impressing flight attendants, Louden pointed

out an advantage of CMOS RAM over magnetic media: "The Model 100 has now been X-rayed twice by the airlines, with no loss of memory," he wrote.

On his way home, Louden used the portable's Basic and sound routines to write a program that played five octaves of music in whole, half, quarter, and eighth notes—presumably trying the patience of people sitting nearby, but apparently causing no harm to the plane's communication and navigation equipment.

According to John Revelle of Rohnert Park, CA, the first rule of Model 100 air travel is to notify the flight crew of its use: "Although the rule is a federal one and the authority is supposed to be with the airline, the actual final word rests with the captain," wrote Revelle in a letter to *80 Micro*.

Meanwhile, Radio Shack is trying to end the uncertainty by collecting owners' reports and offering test 100s to airlines. Said director of computer merchandising Ed Juge, "I don't think there's been any official word yet. The only cases I've heard of someone not using the 100 or being stopped from using it were on USAir. There were a couple of incidents of the stewardess acting on her own, saying 'It's a rule that you can't have personal computers on the plane.'

"It doesn't look like there's a major problem at all," Juge said. "It's just a matter of history and of accumulating evidence to tell the airlines that people have used it, with the captain's permission, and there've been no problems."

"We're in contact with several airlines, all of whom have been offered units for testing; we've made some inroads with them and will possibly be contacting some more," Juge said of Radio Shack's requests for a definite all-clear. "We're trying to work within the existing law; we're not trying to go to the FAA and get a new law. And the existing law states that it's up to the airlines and the individual captains." ■

THE REST OF 80

IT HAD TO GO SOMEWHERE

There's no reason to deprive you of solid microcomputing information just because it wouldn't fit between the covers of *80 Micro*. But even *80*, as thick as it is, can hold just so much. Here's the answer—**The Rest of 80**—31 of the best tutorials and utilities, hand-picked from the overflowing files at *80 Micro*. These never-before-published articles for the Model I and Model III were just too good to let them get away.



SOMETHING FOR EVERYONE

Whatever your programming skills, **The Rest of 80** can help you learn more and save time and effort. Here are just a few of the chapters you'll find:

An Unlistable, Unbreakable Program
Adding Commands to BASIC
Programming in Tiny Pascal
Line Drawing
Automatic Master Disk Directory
Faster Loading for the Model I
ASCII Converter

A Better LDOS KSM
And more on BASIC,

Pascal, and assembly language! Every program is of the same high quality you wait for every month in *80 Micro*. Now try **The Rest of 80**—a welcome addition to your computer library.

ISBN 0-88006-062-X, softcover with spiral binding. 7 x 9, approx. 300 pp. BK7392 \$9.97

Call **TOLL-FREE 1-800-258-5473** for credit card orders. Or mail your order with payment or complete credit card information. Include \$1.50 per order for shipping and handling. Send to: Wayne Green Inc., Attn: Book Sales, Peterborough, NH 03458.



I'D BE LOST WITHOUT IT!

Send me ____ copies of **THE REST OF 80**. Enclosed is \$9.97 (BK7392) per copy plus \$1.50 per order shipping and handling.

MasterCard Bank # _____ VISA AMEX

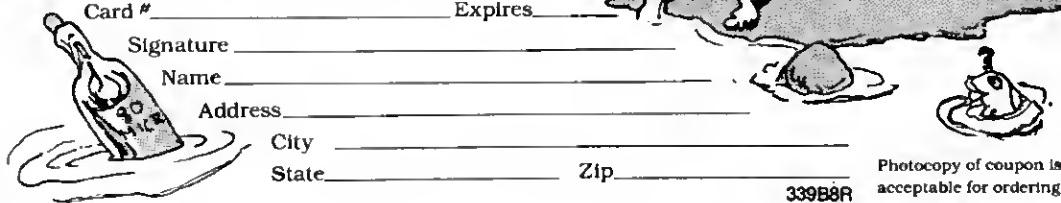
Card # _____ Expires _____

Signature _____ Name _____

Address _____

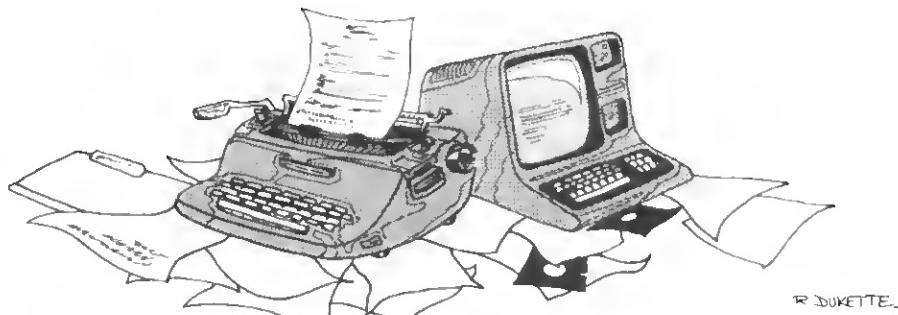
City _____

State _____ Zip _____



Photocopy of coupon is acceptable for ordering.

NEWS THIS MONTH



The Shack's software future

Model 4 gets CP/M, but IBM gets the limelight.

Generalizations about the computer market have a half-life of approximately eight hours, but—in the absence of Peanut, Popcorn, Lisa, and McIntosh—the micro scene of mid-1983 made room for three definite hot properties.

One was the portable computer, with Radio Shack's Model 100 setting the pace; another was the inexpensive home micro, with more powerful machines like the Commodore 64 and the Coleco Adam replacing Timexes and VICs. The third was the IBM PC, attracting flocks of work-alike hardware and compatible software manufacturers.

The PC's success has overshadowed Tandy's Model 4. For years, the naysayers' view was that the TRS-80 was stuck with an orphan operating system, that TRSDOS was a software sideline compared to the 8-bit standard, CP/M. Now the Model 4 is getting, after half a year's postponement, the latest CP/M 3.0—just as software companies are rushing to 16-bit PC-DOS and MS-DOS products. The Model 4 may not be an orphan, but it seems IBM has the biggest family.

Has Radio Shack gone from a DOS dead-end to a hardware dead-end? Microsoft Corp., proud of its Model 100 software and Model 16 Xenix operating system, is maintaining a hands-off attitude toward the rest of the line: "The Model 4 is an 8-bit system, therefore Microsoft doesn't have anything to offer it in the way of an operating system," said public relations director Pam Edstrom.

Microsoft is enjoying immense success in the 16-bit world. The firm's MS-DOS is arguably the single-user stan-



Some of today's best sellers may come to the Model 4.

dard—even Digital Research Inc. has decided to offer its language products on MS-DOS as well as its own CP/M-86.

As for the multi-user Xenix system, which Microsoft licensed to Radio Shack for the Model 16, Edstrom says, "I guess I'd credit Radio Shack to some

extent for having Xenix take off and build some momentum. When Radio Shack, which is one of the major OEMs in the market—and this was the first time Radio Shack had gone outside for an operating system—picks a product, that reassures people it's going to be around for some time."

Radio Shack "went outside" for its alternate Model III operating system, LDOS; Tracy Licklider, vice president of operations for Software Arts of Cambridge, MA, saw LDOS—in Model III mode—playing a sizable role on the Model 4.

"I think that the Model 4 will do fairly well," Licklider said. "I think there's going to be a market for machines of that capability for some time. I think Radio Shack sees it as an upgrade of the Model I/III, analogous to Apple's beefing up the II into the IIe."

"In terms of software, I think it will help somewhat that they have CP/M on the 4, but I think enough of the mainstream applications will be under LDOS in Model III mode or TRSDOS 6.0. I think it'll have the main spread of applications."

Licklider praised the Model 4 as "a very well-priced machine," saying its 64K, two-drive model (\$1,999) compares favorably with the Apple IIe—"There're no color graphics, but for lots of applications such as VisiCalc or word processing you don't need graphics." His one reservation concerned a missing language:

"I think it's sad there's no Logo on it, even a black-and-white one. I understand the Model III has been very popular as a school machine, and Logo would seem a natural thing to have, but I guess the low-resolution graphics prohibited that."

Licklider admitted that the 4 isn't likely to attract state-of-the-art programs: "As for new major innovative software under TRSDOS, I think not; that'll probably be 16-bit or MS-DOS material. But the 4 represents a reasonable market. We have done VisiCalc under TRSDOS 6.0, and, though I can't yet say anything definitely, there's lots of interest in it as a TK!Solver machine."

Bill Hogue, president of Big Five Software, was more pessimistic about Tandy's prospects. Big Five, the company behind such classic TRS-80 games as Galaxy Invasion and Cosmic Fighter, makes its new bestseller, Miner 2049er, exclusively for Atari micros.

"I'm pretty worried about the TRS-80 market," Hogue said. "We have officially left it, though we're still selling some of our older games. If we hadn't come out with our Atari game at the time we did, we probably would have gone out of business. If we'd come

out with a TRS-80 game at the time, we would have gone out of business."

"I've talked to other people and they've told me that nobody's buying TRS-80 software, that sales are down. A lot of stores in my area that used to sell it, as well as Apple and Atari programs, have discontinued it."

"I don't think Radio Shack is going to go bankrupt or anything like that," Hogue said. "But I think they're a little bit behind in technology. I never did like their Color Computer. I heard they were coming out with a new one, and I just saw that toy [the MC-10] they made, and I hope that isn't it."

As a game designer, Hogue prefers Atari's ROMpack capability: "Cartridge is the only place to be. We can put our games on that and piracy's almost eliminated." Asked whether the Model 4's CP/M will boost Radio Shack sales, he said, "No way. The way you make your money is mostly in the games market; that's the home market. Ask the average person who's bought a computer and he doesn't know what CP/M is."

Outside of games, though, CP/M should increase the Model 4 software library. George Tate, president of Ashton-Tate, said "The TRSDOS market is something we haven't been involved with, so I haven't paid much attention to it." Asked whether his firm's dBase II would appear on Model 4 CP/M, however, Tate replied, "Oh, yeah, absolutely. There isn't question one about that."

Can Tandy stay competitive with IBM? "Tandy certainly has their own market. They have a lot of retail stores, and they can be competitive with anyone they choose," Tate said. "And they've shown an ability to do some surprising things, like come out with the Model 100, which I think is a great machine."

"If you look at the market of Radio Shack over time, it's a market that's been almost immune to outside compe-

tition," Tate pointed out. "Most everything that's been sold for them has been sold through Radio Shack stores. I don't think it's a dead end at all."

The consensus that CP/M will mean access to many current, if not brand-new, programs, while new software will come primarily from Radio Shack, was accepted by Ed Juge, Tandy's director of computer merchandising.

"I think there's a lot of CP/M stuff out there," Juge told *80 Micro*. "Now whether we're going to spark a whole rush of new software for the 4, I doubt it. I don't think anybody goes into using the CP/M system with the idea that anybody's going to come out with a lot of new material. You do it to use existing software."

"We don't have any intention of bringing out software under the CP/M system. It's there for the people that want to use CP/M, or the people who want to support it. We believe TRSDOS is pretty locked in now. We've got 50 to 60 people on the phone using it and answering questions, and I don't want to have to hire another 50 or 60 people."

There will, Juge confirmed, be new TRSDOS 6.0 software from Radio Shack. "Probably the first things will be Scripsit and SuperScripsit in 80-column format. There'll be a new Cobol accounting package. That's overdue now, as is CP/M—we thought we'd have CP/M from DRI [Digital Research Inc.] around February or March, and now it looks like the first of September. If there's anything we can do to speed that up, we'll certainly do it, because we think that's an important product."

As for other new software or systems, Juge might have endorsed Tate's comment on Radio Shack:

"They certainly don't do everything right, but they do enough right to survive. My opinion is that Radio Shack will survive and do well and astound us many times." ■

As this issue went to press in late June, Radio Shack confirmed that Jon Shirley, vice president of computer merchandising, was leaving the firm to become president of Microsoft Corp., effective August 1st. Shirley told *80 Micro* that his replacement, while "almost 100 percent likely to be someone from within" Radio Shack, had not been decided upon.

For a full story on Radio Shack and Microsoft, see next month's news section.

HARDWARE

Growing pains for stringy floppy

Delayed success leaves pioneers behind.

Since its introduction at the 1978 West Coast Computer Faire, the Exatron Stringy Floppy (ESF) has attracted a small but loyal following of TRS-80 Model I owners, but has never caught on with the mass market. That's changing now, as new low-end computers launch a stringy floppy boom—which, ironically, leaves Exatron and its current customers out in the cold.

Earlier this year, Texas Instruments licensed the tape-cartridge drive's technology from Entrepo Corp. (Exatron's new name) for its CC-40 Compact Computer (see *80 Micro*, June 1983, p. 318). At June's Consumer Electronics Show in Chicago, stringy floppies appeared in several products, from Atari's Graduate upgrade for the VCS to Unitronics' 48K, \$200 Sonic home micro.

And, giving perhaps the biggest boost to the stringy floppy, Coleco included a non-Entrepo unit in its 80K CP/M-compatible Adam, for which company spokesmen expected sales of half a million units by Christmas.

Meanwhile, current and potential Exatron end-users are stymied by the Sunnyvale, CA firm's reorganization. Wayne King, chairman of Exatron's New York City workshop (a combined user's group and sales force), said he'd heard the company would no longer sell drives or software, just blank wafers, the stringy floppy's storage medium.

It appeared, King told *80 Micro*, that Entrepo was abandoning the retail market for OEM sales, though official information was hard to come by: "Entrepo hasn't notified workshop chairmen, which they could do for the cost of a mailing. The management they have seem to me to be a little bit nutty. They can't decide in which direction they're pulling."

Robert Howell Sr., Exatron's founder, confirmed King's hunch about Entrepo's market direction, though he admitted that the situation was "very confused": "Entrepo is the new name of the company. I started this thing in

my garage several years ago, and about a year ago we brought in new financing and outside management, and they elected to change the focus of the business from the end-user to OEMs. What's going to happen to the end-user business is too confusing to guess. I think it'll get picked up by somebody and carry on as a separate business.

"The [Entrepo] board of directors doesn't know what the hell they want to do yet," Howell said on June 7. "I'm [Exatron's] chairman of the board, founder, major stockholder, and currently I don't have a thing to say about anything. If we got this thing reorganized, I'd hope to restart the end-user business."

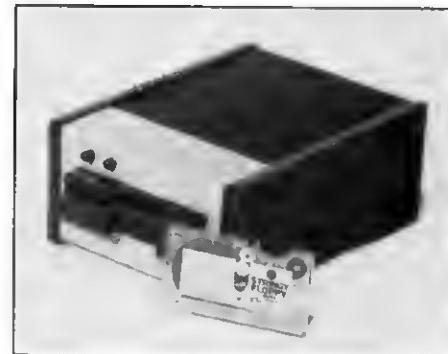
Asked to summarize his view of the stringy floppy's prospects, Howell was optimistic but candid: "My opinion is that the stringy floppy is going to be the standard mass storage technology for the under-\$500 computer and be produced in the tens of millions each year. But I've been believing that for a long time and it hasn't happened yet."

"It is a superb machine—small, fast, inexpensive, easy to use. I don't think there's anything that can touch it. But there's only so much you can do without money. I've been running this out of my garage for a long time."

King agreed, saying that the ESF's low profile had obscured its merits as a high-speed, low-cost compromise between cassette and disk systems. "The machine is a great little device, and it'll do a lot that's never really been tapped," he said. "I'd like the situation to be that when you buy a computer and start out with bulk I/O, before you have disk drives, you have something like a stringy floppy."

"But they never did support software very well, which I thought was a big failing, because the stringy floppy would support a lot of things that it never had software for."

According to King, Exatron had had to rely on hobbyists rather than offer its own line of programs; "The way it was,



The stringy floppy is staging a comeback.

if someone wrote a nice patch to convert a disk program and sent it to them, they'd buy it, but that was about it. So mostly you were left with cassette-based software, and the advantage of that is it loads very quickly, but other than that you might as well have a cassette." The only major commercial program offered for the ESF was Electric Pencil 2.0.

Of the new Entrepo management, King said "They've changed a whole lot from what they used to be. They used to be very reliable, very interested in the end user, and very willing to help out. Obviously, they've got their eyes on the big money, they're going to be the big OEM manufacturer. Which is all right, but if they'd supported the stringy floppy they could have already started a market. There'd be a big base of people using stringy floppies, so other companies would support it."

Robert McDonald, president of Entrepo, shared Howell's optimism while answering King's complaints. "We're winding down the mail-order part of the business," McDonald confirmed. "We have decided to end it. It's going to be ended as far as Entrepo is concerned, it's going to be sold off to somebody. It's a small business, and less strategic, and in a way distracting from the OEM side. . . . Entrepo is really concentrating on selling OEMs to the large computer manufacturers."

However, McDonald said, the re-

MODEL 4 OWNERS

CONVERT your MODEL I/III
PROGRAMS TO RUN ON MODEL 4

Do you have a lot of time and money invested in Model I/III software, well now you can convert Model I/III BASIC programs to Model 4 with CONVERTR.

CONVERTR will eliminate unnecessary spaces and insert all required spaces in your BASIC programs. **CONVERTR** will identify lines which contain keywords not supported by Model 4. **CONVERTR** will identify lines and keywords which the Model 4 handles differently. **CONVERTR** is menu driven and includes an option to list your program and error table on your printer.

CONVERTR comes on a disk and includes an instruction booklet on How to Convert your BASIC programs.

CHECK - MONEY ORDER
COO - -
CONVERTR
1 DRIVE SYSTEM - \$9.00
2 DRIVE SYSTEM - \$9.00

ADEL COMPUTER MART
DEPT 10 BOX 195 • 356
HARTLY, DE 19953
PHONE 5 pm-9 pm M-F
9-5 Sat (302) 492-8463

for the TRS-80 from Micro-Mega

The Original GREEN-SCREEN



The eye-pleasing Green-Screen fits over the front of your TRS-80 Video Display and gives you improved contrast with reduced glare. You get bright luminous green characters and graphics like those featured by more expensive CRT units.

Don't confuse the Original Green-Screen with a piece of thin film stuck to the face of your video tube, such as that advertised by others. The Original Green-Screen is mounted in a full frame perfectly matched to the color and texture of the TRS-80 Video Display. It is attached with adhesive strips which do not mar your unit in any way.

The full frame design of the Original Green-Screen "squares off" the face of your video display and greatly improves the overall appearance of your system.

(Specify whether for Model I or Model III)

THE GREEN-SCREEN.....\$15.95
Add \$1.50 for postage and handling.

Terms: Check or money order, no CODs or credit cards, please. Add amount shown for postage and handling to price of the item. All items shipped within 48 hours by first class or priority mail. Virginia residents, add 4% sales tax. ✓162

Micro-Mega • P.O. Box 6265 • Arlington, Va 22206

Gold Plug - 80

Ahhh, instant relief! At last there is a permanent cure for contact oxidation on Model I edge connectors. Many TRS-80 users are familiar with the symptoms: untimely resets, spontaneous reboots, or the inability to get the computer started at all without a frustrating session with a pink eraser.

The Gold Plug 80 is a well made device consisting of an edge-card plug with gold plated contacts, available with either 34 or 40 contacts. The rear of the plug has ter-

TRS - 80+ MOD I, MOD III, COCO

minal tabs which fit exactly over the existing foil fingers on the TRS-80's connectors. After installation, the original plugs have been extended about a half inch, meaning that the plastic door covers no longer fit. This did not trouble me, but you should take it into consideration. E.A.P.'s advertising leaflet, by the way, cautions you about the doors, which is refreshing. They also have the excellent policy of permitting you to return any plugs ordered for a refund if after seeing them you are un-

willing to undertake the installation.

An excellent set of instructions accompany the plugs, and they are shipped promptly. I ordered mine by mail on a Monday and received my set of plugs by first class mail on Tuesday of the next week.

Installation

Installation requires a soldering iron (I use a 40-watt Weller), Rosin-core solder, a Phillips screwdriver, and your last Pink Pearl. The keyboard and Expansion Interface have to be disassembled to get at the connectors, which are then cleaned—the eraser's last fling. The Gold Plug 80 is fitted over the existing plug with the contacts centered, and then soldered to the board. I have some soldering experience, but it proved to be an easy, safe job. The contact is heated, a very small amount of solder applied, and then you go on to the next contact. It took about an hour to do all six plugs.

GOLD PLUG 80 Mod I (6)	\$ 54.95
Keyboard/EI (mod I)	18.95
Individual connectors	9.95
COCO Disk Module (2)	18.95
Disk Drives (all R.S.)	9.95
Gold Disk Cable 2 Drive	29.95
Four Drive Cable	39.95
GOLD PLUG 80 Mod III (6)	54.95
Internal 2 Drive Cable	29.95
Mod III Expansion port	10.95
USA shipping \$1.45 Can/Mex \$4.	
Foreign \$7. TEXAS 5% TAX	



The Gold Plug 80

GOLD PLUG 80-E.A.P. COMPANY
P.O. Box 14 Keller, TX 76248 (817) 498-4242



ADVERTISEMENT

Reprinted by permission of 80 Micro, copyright 1982.

80 Micro, September 1983 • 295

vised company would not forget today's 5,000-10,000 ESF owners: "It's going to be supported," he said of the ESF. "We did confuse people, by the way; as we ship new units we're sending a letter explaining the change. The product will probably be supported by another company that will emerge, probably not under the Exatron name. When there is an end-user thing that re-emerges, we will advertise and promote that far and wide and alert people to it."

As for the OEM market, McDonald described the new wafer-equipped computers as only the tip of the iceberg. "Texas Instruments has a license for the whole technology, to manufacture it for their own requirements. So they can do what they want with it, except sell it to other people. Coleco has gone to another technology, primarily because we are not ready to gear up at the speed they wanted. We expect to be in high-volume production by mid-September."

At the Chicago CES, McDonald said, "We had interest from virtually everybody in the low-end computer market," mentioning Milton Bradley as well as Atari and Sonic. "We have discussions and contract negotiations going on with other companies."

What about software? "One of our reasons for working with OEMs is to have them supply the software. We won't be doing that ourselves, though we'll be supplying duplicating services for the manufacturers.

"What we're doing initially is letting the OEMs use all their pull and power to get the software authors, the publishing houses, in with them with the media.

"I think downstream we may get back into it. We won't have the hobbyists write or convert software and send it in—some of those people may participate; some of them are very talented folks. But we'll try to do it more professionally."

In an echo of King's and Howell's opinions of the stringy floppy's future, McDonald predicted, "I think it's finally going to get its due in the marketplace. We're very, very bullish. We're so bullish that we think we have a chance to become the media standard. Execution is the problem now, not market acceptance. We're really planning on this being a large industry."

"We never did handle the end-user business very professionally," McDonald said of the Exatron/Entrepo switch.

"We did not handle the phase-out very professionally, either, so I guess I owe an apology to the end-user."

As this issue went to press in late June, Howell reported raised hopes for confused owners: "It looks like we're well on our way to reorganizing our end-user business. It looks as if the ESF

owners' association is going to take over support of the product and distribute both hardware and software.

"There is a group of people actively involved in putting together a support system. If it happens, we'll send an announcement in the mail to our customers." ■

GAMES

Whatever happened to Tandyvision?

Plunging prices end Mattel/RS venture.

First there was Atari, with a monopoly on both home video games and VCS software; then came Mattel Electronics' Intellivision, with George Plimpton hawking better graphics. Then came ColecoVision and the improved Atari 5200, and hundreds of game cartridges from dozens of companies. The video game industry has always been chaotic; by early this summer, with consumers abandoning game systems for competitively priced home computers, it appeared the bottom had dropped out of the market.

Radio Shack is a computer, not a video game, company; the Color Computer is priced and positioned above both game machines and low-end micros, and the Models 1/III/4 have unashamedly bad graphics. But the Fort Worth firm did make a stab at the Space Invaders market last year with Tandyvision—a relabeled Intellivision, made by Mattel and sold in Radio Shack stores.

Tandyvision was introduced in November 1982, just in time for the Christmas buying rush. Within six months, it had sunk without a trace. Gail Lacour, manager of Displayed Video's RS dealership in Ypsilanti, MI, told *80 Micro*, "Radio Shack has discontinued those, I believe around March. They were SOWG's, Sold Out When Gone. They don't even sell cartridges anymore. We couldn't order them if we

tried."

What happened? From all indications, Tandyvision was torpedoed by the unsettled game market generally and by Intellivision price cuts specifically: Radio Shack bought units from Mattel and, adding a margin for profit, sold them to consumers—until Mattel offered price reductions and rebates for its version, leaving Tandy in the position of someone who buys something the day before a sale.

When Tandyvision debuted in the November 1982 catalog, it was competitively priced at \$249.95. Within weeks, however, Plimpton was on TV plugging a \$50 Mattel rebate. By spring, discount stores were offering Atari VCS systems for under \$100, and Intellivision and ColecoVision prices had fallen to \$180, with sale prices as low as \$150.

"From what we understand, what happened to Radio Shack was the same thing that happened with the TDP-100 versus the Color Computer," said Jack Torres of Computer Plus in Littleton, MA. "When Radio Shack took on the line, Mattel reduced the price, and you could get an Intellivision for less than a Tandyvision."

Added Displayed Video's Lacourse, "The reason [Tandyvision was discontinued] is the simple fact that Mattel, while selling the product to Radio Shack, did not inform Radio Shack that they were going to continue to lower prices and offer \$50 rebate programs. So the dealers were complaining, be-

cause people could buy them in the store for less than they [dealers] were paying for them."

For its part, Mattel isn't talking. Kathy Kennedy, Mattel Electronics' press agent, told *80 Micro*, "Our company has a policy of not commenting on someone else's business."

While the unit was a Mattel item, she said, "Tandyvision was really their brand name. They marketed it and that was their product. You'd have to talk to Radio Shack about that."

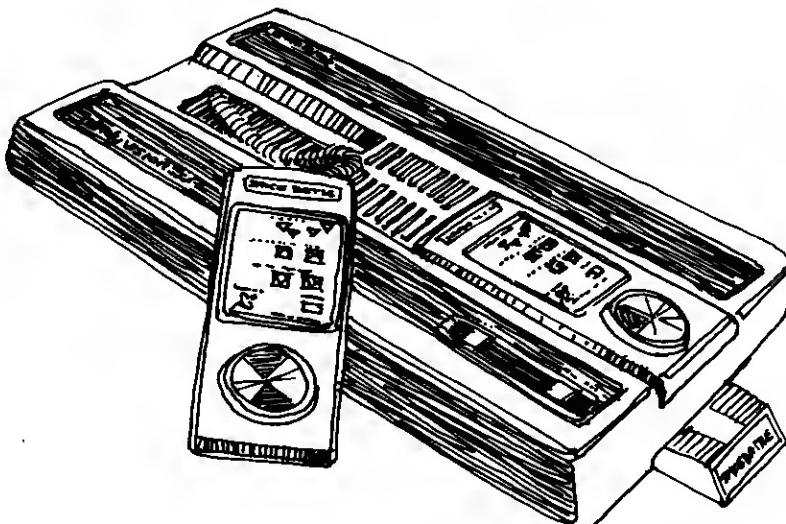
Kennedy did acknowledge Mattel's aggressive rebate policy: "There were like three rebates at different times. There was one in October; I believe there was a \$25 rebate as well, leading up to Christmas." Also, there were Plimpton's \$50 rebate commercials of early 1983, with the spokesman first refusing to participate in a circus ad and later agreeing after being put in a lion's cage. "There have been several rebates," Kennedy concluded, "to help the retailers sell the product and increase our installed base."

Leon Lutz, Tandy/Radio Shack's video game buyer, confirmed that the remaining Tandyvisions will be the last: "Oh, we're selling them out. We've got them on sale at \$159.95 and cartridges at half price. . . . We haven't bought any more units from [Mattel]. They dropped Intellivision and came out with Intellivision II, which we don't sell."

The product will, he said, be supported: "We service them ourselves, if it's a Tandyvision. The cartridges are Intellivision cartridges; if there's a problem with them you send it to Mattel. We have quite a large number of cartridges left, and we're selling them off."

Did Mattel's price reductions stab Tandy in the back? "I can't say they stabbed us in the back. I mean, the market went to pot when Texas Instruments introduced their \$100 computer. Everybody and his uncle got into the act with computers and video games. And Mattel responded to the market with a \$50 rebate."

Rather than be too critical of Mattel—"Well, the rebate kind of kicked it in the butt a little bit, but again, that was the market"—Lutz thought that some dealers might have cleared Intellivision inventories to make way for Atari. "You can find them at a lot of different prices around the country. I would assume some people are trying



Tandyvision: The TDP-100 of video games.

ing to unload some units because of Atari's wanting an exclusive marketing agreement.

"There are some Mattel distributors and dealers out there who are selling units at a very good price simply because of that arrangement; if you want to sell Atari, you can't sell any other unit. But that's just speculation on my part."

(Bruce Entin, Atari's vice president for public relations, rebutted Lutz's idea of Atari's marketing policy: "That is not true. We use exclusive distributors, but you can't tell a retailer what to sell or what not to sell. You can see the different machines in stores all over the place.")

Ultimately, Lutz said of the Tandyvision venture, "We want to be competitive in the marketplace, and we could not be competitive at the gross margin the company operates on. We tend to want to make money on our product line."

Has the Tandyvision incident soured relations between Mattel and Radio Shack? "We're still good friends, in fact I met them at the CES show in Chicago." Might the two work together again? "It's not impossible. There's nothing planned at the moment, but it's not unthinkable."

"I think they're a good company, a very good company, and it was just their having to respond to the marketplace, not a problem with us. There's no bad feelings in the company."

"The video game market is kind of unstable, in my opinion." ■

Game Over?

From recent reports, it looks as if losing the video game business was no hardship for Radio Shack.

In London, where Intellivision prices have fallen from \$218 to \$157, the head of Mattel's British unit told the *Wall Street Journal*, "Our forecast for 1983 and 1984 is just about static. The market is under attack by the home computer sector."

Looking at U.S. companies, *Fortune*'s Bro Uttal was more severe: "The

entire video game market could collapse because the line between game consoles and home computers is blurring. If the line vanishes, the computer is likely to replace the game console because it can do more than just play games."

At this rate, the whole industry might repeat the marketing shift from games to programming that Tandy made with the Color Computer. And Mattel—whose Aquarius computer has barely scratched the market—may be the worse off.

DEVELOPMENT HARDWARE / SOFTWARE GTEK MODEL 7128 EPROM PROGRAMMER



- Microprocessor based intelligence for ease of use and interface. You send the date, the 7128 takes care of the rest.
- RS-232 interface and ASCII data formats make the 7128 compatible with virtually any computer with an RS-232 serial interface port.
- Auto-select baud rate,
- Use with or without handshaking. Bidirectional Xon/Xoff supported, CTS/DTR supported.
- Devices supported as of DEC 82:

NMOS NMOS CMOS EEPROM	MPLU'S
2758 2508 27C16 5213	8748
2716 2516 27C32 X2818	8749
2732 2532 C6716 48018	8741
2732A 2564 27C64	8742
2764 68768	8751
27128 8755	8755

- Read pin compatible ROMS also.
- Automatic selection of proper program voltage based on type selected.
- Menu driveneprom type selection, no personality modules required.
- (40 pin devices require adapter)
- INTEL, Motorola, and MCS-56. Hex formats. Split facility for 16 bit data-paths. Read, program, and formatted list commands also.
- Interrupt driven type select, program and verify real time while sending data.
- Program single byte, block, or whole eprom.
- Intelligent diagnostics discern between eprom which is bad and one which merely needs erasing.

GTEK INC.

- Verify erasure and compare commands.
- Busy light indicates when power is being applied to program socket.
- Complete with TEXTOOL zero insertion force socket and integral 120 VAC power supply. (240 VAC/50HZ available also)
- High Performance/Cost ratio,
*** Model 7128 PRICE \$389.00 ***

MODEL 7128 SOCKET ADAPTERS
MODEL 481 allows programming of 8748, 8749, 8741, 8742, single chip processors.
Price \$99.00

MODEL 511 allows programming the 8751, Intel high powered single chip processor.
Price \$174.00

MODEL 755 allows programming the 8755 EPROM/I/O chip
Price \$135.00

MODEL 7128/24 - budget version of the 7128. Supports 24 pin parts thru 32K only. Upgradable to full 7128 capacity.
Price \$289.00

Non-expendable, very low cost models available for specific devices.

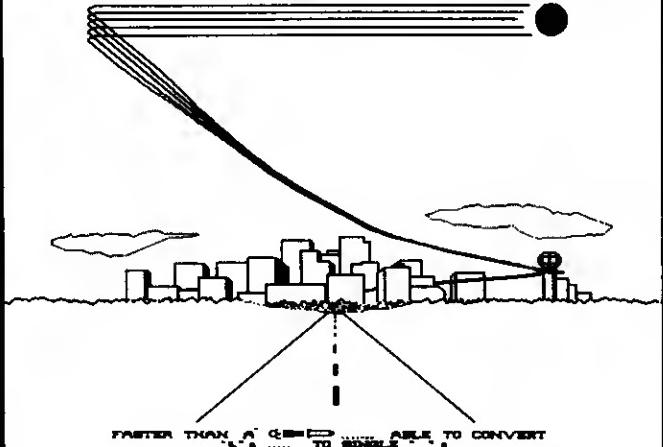
MODEL 7128-L1 for 2718 only \$148.00

MODEL 7128-L2 for 2732 only \$179.00

Also available from stock:
Eeprom Erasers UVP model DE-4 . . . \$78.00
Avocet Systems Cross Assemblers \$200.00
RS-232 Cable Assemblies \$25.00
Programmable Devices call
Complete development system . . . \$3240.00

Post Office Box 289
Waveland, Mississippi 39576
(601) 467-8048

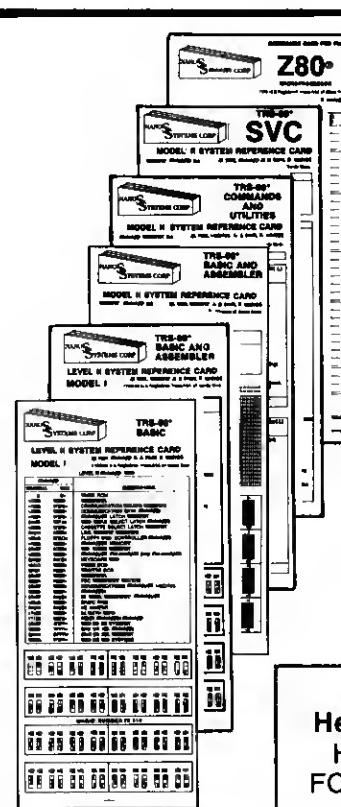
POWER DOT



NEW! PowerDOT allows you to create HI-RESOLUTION screen prints on EPSON (Graftrax and Graftax+), C.Itoh PROWRITER, and Radio Shack LP 8 printers without ANY hardware additions or modifications to your TRS-80! You can draw directly on your screen which is a "picture window" of a much larger drawing area, therefore allowing you plenty of room to work. You are only limited by memory size and your imagination! Great for designers, architects, engineers, etc. Model I or III disk version only. Works on all current operating systems. \$49.95 \$2.50 shipping (U.S./Canada)

POWER DOT
Products from Breeze/OSD, Inc.

✓315 11500 Stemmons Fwy.
Dallas, Texas 75229
To order call toll free 1-800-527-7432
For product information (214)484-2976



SYSTEM REFERENCE CARDS

"This is a quality document and is beautifully conceived and produced... I am in awe of your magnificent document."

H.W.W., Dayton, Ohio

Send Check or Money Order

MODEL I: BASIC & Assembler	FC1002	\$4.95
MODEL I: BASIC Only	FC1001	2.95
MODEL II: BASIC & Assembler	FC1005	5.95
MODEL III: BASIC & Assembler	FC1003	5.95
MODEL III: BASIC Only	FC1004	3.95
COLOR: BASIC & Extended	FC1006	4.95
POCKET: BASIC	FC1009	2.95
APPLE II + II PLUS: BASIC & 6502	FC1008	4.95
APPLE II + II PLUS: BASIC Only	FC1007	3.95

NEW!

NEW!
Heath/Zanith
HDOS 2.0
FC1014 \$5.95

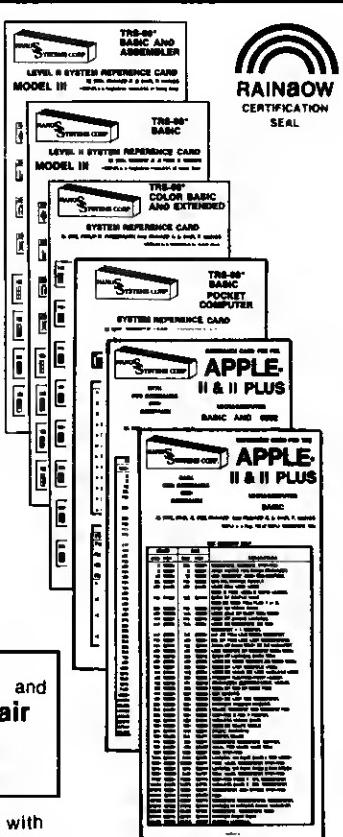
Z80
MICROPROCESSOR
FC1011 \$4.95

ZX80, ZX81 and
Timex Sinclair
1000
FC1012 \$5.95

Call TOLL-FREE for Credit Card Orders 1-800-258-5473. Or, send your order with payment or complete credit card information to:

WAYNE GREEN BOOKS • Retail Sales • Peterborough, NH 03458

Enclose \$1.00 per order for shipping and handling



PULSE TRAIN

10-megabyte floppy disk



A breakthrough that will keep the familiar floppy disk competitive with hard units can be summarized in a crude analogy: More cigars can be packed into a box standing on end than lying flat.

Eastman Kodak Co.'s Isomax floppy disk, introduced at the National Computer Conference in Anaheim, CA, uses isotropic cobalt-enhanced magnetic particles to store up to 10 times the information of a normal disk. (Isotropic means "having properties with the same values along axes in all directions.")

Today's floppies use cigar-shaped particles aligned horizontally, parallel to the disk's surface; Kodak's egg-shaped particles can store data vertically, squeezing up to 10 megabytes in a 5 1/4-inch space.

The dense-pack disks were created by Kodak's research labs in France and the U.S., and are being produced by the company's Spin Physics division in San Diego, CA. William Kroon, the division's director of marketing, told *Computerworld* that Isomax disks hold data horizontally as well as vertically, or at any angle in between, but that the vertical format gives the greatest capacity for the money. The floppies cost between \$10 and \$20 per disk in quantities of 1,000.

The disks will be commercially available late this year and carry a two-year (five-

million-pass) guarantee, but you can't pop one into your TRS-80: Kodak is now selling them to about 10 major disk drive manufacturers, who are producing drives that meet Isomax's requirements (a 20- instead of 50-micron gap between recording head and media).

Horizontal recording, however, isn't dead yet. This September, Amllyn Corp. of San Jose, CA will start shipping a half-height drive that uses a mylar scale and precise head control to put 170 tracks per inch on a 5 1/4-inch floppy, providing 3.3 megabytes unformatted or 2.13 megabytes formatted storage.

A home away from home



If a bed, a bath, sanitized glasses, and Magic Fingers aren't enough, you might want a room with a micro. Two companies are now supplying in-room smart terminals to upper-bracket hotels, allowing travelers to play games or send electronic mail as easily as scan the room service menu.

Travelhost Inc. of Dallas, TX, the nation's largest hotel supply company, has agreed to purchase as many as 500,000 videotext terminals from Quazon Corp. over the next two and a half years. The membrane-keyboard, Z8-equipped terminals link with the rooms' TV sets and United Telecom Inc.'s Uninet



SuiteTalk: Making hotel life more electronic.

communications network to offer airline schedules, news and stock information, and e-mail (using ITT Dialcom).

The company anticipates adding games, restaurant menus and reviews, and online shopping to the service, which costs \$20 per hour in prime time and \$7 per hour at night. Member hotels, such as the Midland in Chicago (the first to offer Travelhost's terminals), receive \$1 every time a guest goes on line.

A similar service is provided by SuiteTalk, the creation of HotelTech International. The Belvedere, CA firm charges hotels \$1,000 a month to lease a Concierge source micro, designed in cooperation with Sony, and \$30 a month for each in-room SuiteTalk unit—a device that looks like a slightly modified Color Computer, though HotelTech cofounder Susan Martel says "It's something we're going to be making

ourselves."

SuiteTalk users have free access to menus describing hotel services, local shopping and transportation guides, and CBS and NBC information services. Guests connect with a home or office computer for the cost of the phone call, and \$20 an hour (\$9 at night) provides access to games, news, word processing, e-mail, and airline information. The hotel management can put local businesses' ads on SuiteTalk, too.

Both HotelTech and Travelhost stress their terminals' ease of use and convenience for data-hungry travelers. As the price of technology comes down and micros become standard equipment in more hotels, Martel says, even computer novices will get hooked: "I think it's going to be a terrific way to sell more personal computers. People who use them in the hotel will want one of their own."

BOOT ERROR DC

PLUG YOUR MOD II
DISC EXPANSION UNIT INTO THE
SeeBee UNIT AND FORGET ABOUT
THE BOOT ERROR DC MESSAGE

"In my opinion, all users of older Model II's...
should get a SeeBee as cheap insurance against
the dreaded Boot Error."

R.H. Young, Editor/Publisher
Two/Sixteen - Jan-Feb 1983

"SeeBee performs as represented. It's a better
mousetrap..."

C.R. Perelman
Product Review
80 Micro - July 1983

- Totally software transparent
 - Run your disk expansion unit only when needed
 - Eliminate ruined system diskettes
 - Compact 2 in. x 3 in. size
 - Simple plug in installation
 - Money back guarantee - 90 day warranty
 - \$64.50 plus \$3.00 shipping and handling
 - Indiana residents - add 5% sales tax
- PLEASE SPECIFY IF YOU ALSO HAVE A HARD DISK

MICROCOMPUTER PRINTOUT BASKET

- Use on any table
- Sturdy steel construction
- Beige epoxy finish
- Special power cord & signal cable retainer
- 12 inch \$22.50 18 inch \$24.50 plus \$3.00 shipping and handling

SYSTEMS ENHANCEMENT
ENGINEERING, INC.
P.O. BOX 40215
INDIANAPOLIS, IN 46240
317-844-8817

✓63
VISA

✓63

✓63

CALC "HELPER" FOR THE TRS-80® MODEL III

- Enters most VisiCalc® commands with one keystroke.
- Helps inexperienced users of VisiCalc learn quickly.
- Helps experienced users work faster.
- Does not alter program on disk or require knowledge of any passwords.
- Uses only a few hundred bytes of VisiCalc® memory.

\$29.95

MasterCard & Visa accepted
Wisconsin residents add 5% sales tax
Indicate DOS used and VisiCalc version

The Business Software Team
639 Brookridge Street
Green Bay, WI 54301 ✓236

REAL VOICE SYNTHESIZER/ANALYZER

OKI SEMICONDUCTOR'S REAL VOICE SYNTHESIZER/ANALYZER IS A REALITY FOR TRS-80 M 3 & 4™.

NOT A KIT BUT A FULLY FUNCTIONAL SYSTEM. FULL DOCUMENTATION INCLUDED.

POSSIBLE APPLICATIONS:

- DIGITAL RECORD/PLAYBACK - VOICE OR MUSIC
- MULTI-LINGUAL ANNOUNCEMENT SYSTEM
- DIALER/DECODER
- VOICE RECOGNITION
- SOUND EFFECTS

SYSTEM INCLUDES POWER SUPPLY,
SYNTHESIZER/ANALYZER, DISK WITH
DRIVER SOURCE & SAMPLE RECORD/
PLAYBACK PROGRAM

KIT \$249.95
FULLY ASSEMBLED & TESTED 349.95
CONNECTOR CABLE 25.00

Above prices include shipping and handling

FOR MORE INFORMATION CONTACT

DATA DISPLAY CORP.

BOX 284

HANOVER, NH 03755

1-800-227-3800

Ext. 110 with orders only



✓19

TRS-80 M 3 & 4 is trademark of Tandy Corp

TRS-80™ "CAN YOU BUY DIRECT?"

HAVE YOU GOT OUR PRICES?

WILL YOU PAY TOO MUCH?

WARRANTY:

the RADIO SHACK warranty
accompanies all R. S.
merchandise sold by us.



SAVE SALES TAX*
PLUS DISCOUNT

*TEXAS RESIDENTS ADD ONLY 4%

FORT WORTH COMPUTERS

(Located 30 miles from Fort Worth)

377 Plaza • GRANBURY • NR FORT WORTH • TEXAS 76048

TOLL FREE NUMBER: 1-800-433-S-A-V-E

IN TEXAS CALL: 817-573-4111

TM: TRADE MARK OF RADIO SHACK

✓214

PULSE TRAIN

Remembering the Model I



It's an insult if an IBM PC owner calls your TRS-80 a "museum piece," but it's all right if the Smithsonian Institution does. The National Museum of American History in Washington, DC owns over 100 computers; of the fewer than 12 micros in the collection, one is a vintage Model I.

According to *InfoWorld* reporter Kathy Chin, the Smithsonian's panel "chooses items that it judges to be historical firsts or that represent the state of the art in microcomputing." The Model I, "one of the early popular computers," shares exhibit space with an Imsai 8080 ("one of the well-known homemade models") and the price-breaking Timex-Sinclair 1000.

Other classic-computer organizations seem to be following the museum's lead,



Is your Model I a valuable antique?

pioneering in a field where machines from 1978 have almost antique status. The Blacksburg Group of Blacksburg, VA, which preserves older micros as a sideline to producing computer books, has a Model I in its collection. And Jamie Parker, exhibit coordinator of The Computer Museum of Marlborough, MA, says her institution is

looking for a Model I donor. *InfoWorld's* Paul Freiberger and John C. Dvorak, lumping early Tandy micros with Exidy Sorcerers and Sol-20s in an article titled "Obsolete Computers," say "Many tight-fisted users consider the TRS-80 Model I to be a workhorse. They have found ways to upgrade to double-density disks and add

uppercase and lowercase, and they manage to keep the machines running.... With about 250,000 old Model Is out there, it will be a while before they are truly obsolete.

"The big plus for the old Model I," Freiberger and Dvorak claim, "was the detachable keyboard, which was ahead of its time. It allows users to sit back in their easy chairs and type away, without having to worry about the back strain that comes from hunching over an immobile terminal keyboard. Many TRS-80 fanatics still wonder why Radio Shack puts an old-fashioned immobile keyboard on its newer machines."

Radio Shack's vice president for computer merchandising, Jon Shirley, gave one answer to that question at a Boston Computer Society meeting in May (see *80 Micro*, August 1983, p. 280). The TRS-80, Shirley reminded the audience, is extremely popular with schools; teachers and administrators prefer the one-piece design, he said, as it means fewer pieces to lose and cables to tangle. ■

Breakdowns and shakeups

• Enter Date (MM/DD/YY): MASSACHUSETTS' new auto emission and safety inspection campaign stopped abruptly on June 1. While service stations' 1,205 Hamilton Test Systems computers worked without a hitch during their first two months on the job, the machines' chips refused to accept "June" in their programs. **END BYTES**

Repair crews hurried to fix the June bugs; some computers were temporarily reprogrammed and told it was December.

Meanwhile, the state considered extending the monthly inspection period, and motorists, like uninspected cars, fumed.

With heavy competition in the video game market, the model 400 and 800 computers showing their age, and the 1200XL crushed by the less expensive Commodore 64, **ATARI** has regrouped. Warner Communications has merged its troubled subsidiary's computer and game divisions, dropped the three unsuccessful micros, and introduced four new models: the 600XL, 800XL, 1400XL, and disk-equipped 1450XLD. The firm has also hired Alan Alda to do commercials.

Atari watchers expected the consolidation to mean a loss of several hundred jobs at the firm's Sunnyvale, CA headquarters. A possible upturn might come in early 1984, when Warner's Ataritel line begins shipment of computer telephone devices.

● While Atari's slipping, IBM is in the **CHIPS**. In fact, so many Big Blue imitators want Intel 8088s and 8086s for their PC clones that there's a five-month-plus waiting list. One supplier is said to have turned down a spring order for 400,000 of the 16-bit CPUs because it had already sold its entire 1983 production.

Dave House, vice president of Intel's microprocessor division, told the *Wall Street Journal*, "The market's going crazy with buying. It's not healthy and it cannot last. What's scary is that there are at least 30 customers out there who each are buying microprocessors as if they intend to capture 30 percent of IBM's market."

● Electronic Arts, a San Mateo, CA publisher of Apple, Atari, and Commodore programs, is leading the way in **CELEBRITY** software. Cartoonist Gahan Wilson is designing graphic games for the firm, and NBA stars Larry Bird and Julius Erving have donated their strategies and images to a basketball game.

● "Desktop USE is not keeping pace with desktop purchases," says the Yankee Group, a Boston-based market survey firm. In two surveys, the group found that more than two-thirds of corporate managers used their micros less than half an hour per day.

To keep desktops from gathering dust, the surveyors call for integrated, easy-to-use software, machines designed for managers rather than professionals, and more emphasis on communications (data base access, file compatibility, and electronic mail). "Function, rather than price, will fuel market growth," they conclude.

● Next month, for a change, End Bytes will not mention new computer **MAGAZINES**. This month's crop includes

Personal and Professional, for DEC desktop users; **Microkids**, a bimonthly for 10- to 16-year-old beepers from Warner Software; **Teaching, Learning, Computing**, a computer resource for educators; and **Personal Robotics News**, a monthly newsletter for the infant home-android industry.

● A new toll-free number lets users express their opinions or ask questions about the health effects of **CRT TERMINALS** (see *80 Micro*, July 1983, p. 338). The number, 800-521-VDTS (in Ohio, 800-522-VDTS), was created by 9 to 5, a national association of clerical workers, in the wake of the Massachusetts legislature's introduction of a bill to regulate CRT installation.

The Massachusetts bill would require six months' advance notice of CRT installation, employer-paid annual eye exams, "ergonomically correct" or adjustable equipment, and regular work breaks for CRT operators.

● Last month, this column mentioned Epson's sponsorship of the Miss World pageant in the U.K. Here in the States, the firm projects a more serious image. The latest product from Epson America Inc. is a \$150,000 **LIMOUSINE**.

As reported in *Computerworld*, Epson commissioned a Beverly Hills, CA remodeler to add 52 inches to an already lengthy Mercedes 450 SEL, outfitting the interior with QX-10 and HX-20 computers and a printer—as well as TV, video cassette recorder, telephone, bar, electric clothes steamer, manicure set, nail dryer, and shaver. It seems the average corporate executive wastes about 40 hours a month traveling by car, out of reach of office messages and stock reports; Epson's auto keeps the wheels of business turning. ■

COLUMBIA DATA MPC



COLUMBIA System Includes IBM COMPATIBLE Dual 320K Floppies, 128K RAM. Two RS 232 Serial ports, Centronic Printer port, IBM Compatible Keyboard, Hi-Res Color Graphics Card, Green or Amber Monitor and more.

\$3,000 IBM Software bundle including Perfect Writer, Speller, Calc, File, Graphs Communications Support, Space Commanders, Col Tutor, Diagnostics, BASIC, MACRO Assembler & MS DOS

COLUMBIA LOW TOTAL PRICE CALL

OTHER COMPUTERS

- COMMODOR 64 CALL
- EAGLE II Business Computer \$1995
- EAGLE III Business Computer \$2695
- EAGLE IV Business Computer \$3495
- EAGLE 1630 Computer \$5995
- ALL EAGLE CPUs Includes Software Bundles
- NEC PC-8001A, PC-8012A, PC-8031A, IB-1201, PC-8023 w/Software \$1995
- NEC PC-8800 8-BIT or 16-BIT w/Software CALL
- NEC APC SYSTEM 16 bit CALL
- SANYO MBC-1000 with Bundled Software \$1595
- SANYO MPC-3000 with Bundled Software CALL
- XEROX 820 CALL

CALL 7 DAYS

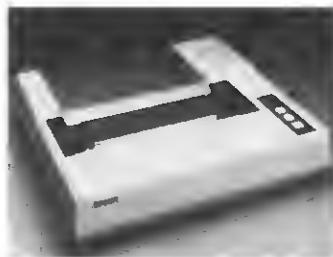
(800) 854-8498

Calif. (714) 545-2216

COOSOL, INC. P.O. 2642 COSTA MESA, CA 92626-2642

COMPUTER BARON 3017 HARBOR BLVD. COSTA MESA, CA 92626 714 979-2488

EPSON PRINTERS



MODEMS

- HAYES SMARTMODEM (300 BAUD) \$227
- HAYES SMARTMODEM (300 & 1200) CALL
- HAYES CHRONOGRAPH \$199
- NOVATION I-CAT \$120
- NOVATION 212 AUTO-CAT CALL
- SIGNALMAN MARK I and others CALL
- UDS Series Modems CALL

APPLE SOFTWARE

- ASTON TATE D BASE II \$465
- CONTINENTAL ACCOUNTING CALL
- DATAMOST CALL
- HOWARD - REAL ESTATE ANALYZER \$167
- I.U.S EASY WRITER \$89
- LOTUS CALL
- MICROPRO WORDSTAR \$372
- MICROTEX CALL
- SOUTHWESTERN DATA SYSTEMS CALL
- STONEWARE CALL
- SUB LOGIC FLIGHT SIMULATOR \$33
- VISI CORP - VISICALC \$239

EPSON FX Series NEW

- EPSON RX 80 w/GRAFTRAX + CALL
- EPSON MX-100, 80, & F/T w/GRAFTRAX + CALL

OTHER PRINTERS

- NEC 3550 CALL
- NEC 3510, 2515, 3520, 3525 & 3530 CALL
- NEC 7710, 7715, 7720, 7725 & 7730 CALL
- NEC PC8023A C \$449
- GEMINI 10 \$355, GEMINI 15 \$499
- CITOH 8510 Parallel or Serial CALL
- CITOH 1550 Parallel or Serial CALL
- CITOH F10 40 and F10 55 Par or Ser CALL
- TALLY MT160 \$799
- TALLY MT1602, MT1605, MT1802 & MT1805 CALL
- DIABLO 630 CALL * DIABLO 620 \$989
- IDS 80 and 132 PRISM Printers CALL
- QUME SPRINT 11/40 and others CALL
- ANADEX ADX 9000 AND OTHERS CALL
- BROTHERS HR 1 Serial or parallel \$799
- COMREX CR 1 Serial or Parallel CALL
- DAISYWRITER 2000 w/48K Buffer CALL
- TOSHIBA P1350 P or P1350 S \$1649
- SILVER REED EXP550-P or EXP550-S CALL
- SMITH CORONA TP 1 and others CALL
- TRANSTAR 315 CALL
- TRANSTAR 130 CALL

APPLE CARDS

- AMDEK RGB COLOR II INTERFACE \$169
- M&R ENTERPRISES RGB INTERFACE \$69
- PRACTICAL PERIPHERALS MICROBUFFER II CALL
- VIDWX VIDEOTERM CARD \$285
- WESPER MICRO SYSTEMS CALL
- BPD 16K EPSON OKIDATA NEC \$159
- WIZARD IPL \$85
- OTHER APPLE CARDS CALL

Caimans and condos



What was that?" I asked, veering to avoid some sort of animal in our path.

"I don't know, but they're all over the place." Mad Max peered fearfully out the window. "Reptiles. Lizards."

"Stop a minute," Mercedes ordered. I did so, thinking she meant to wait while the things crossed the road. Instead, she popped out the door and came back with one.

"It's a crocodile!" shrieked Max, climbing onto the PMC for safety.

"No, it's an alligator," I reassured him. Max stayed perched.

"It's a caiman," Mercedes said, stroking the thing. "Lots of them here in Florida. Isn't it cute?"

"Cute?" We were more shocked at Mercedes' use of the word than its application to the toothy creature.

"Yeah. I think he likes me," she beamed, oblivious to Max's protests of being allergic to amphibians.

"Speaking of Alien Defense, what do you think of this?" I asked, trying to steer the conversation back to our alleged topic at hand. I handed Max a letter from Ken Corless of Pomona, NY, in which he claimed an astronomical score of 13,485,500.

"My God!" Max screamed.

"The man's obviously made a deal with the underworld," said Mercedes. "The Devil and Ken Corless."

"But wait," said Max. "Listen to this: It seems that if your last humanoid is being picked up and you shoot him, the program does not recognize that you should go to deep space. Instead, it thinks you have 256 humanoids left that cannot be picked up. As a result, each completed wave awards 25,600 bonus points."

"Geez," said Mercedes, reading over Max's shoulder. "He played for 16 hours, and had over 100 ships and bombs left!"

"He says he got 1,111,100 the legitimate way," Max continued. "There's a trick to that, too. You go into deep

space, shoot open a pod, and hyperspace. Then you accelerate slowly until you see swimmers right on your tail. Next, you shoot another pod and hyperspace again. Now you've got two pods' worth of swimmers half a screen behind. Any other pods you shoot will not release swimmers."

"Nothing's sacred anymore," Mercedes said. "Next thing you know, people'll be getting 10 million in Lunar Lander."

After two more hours on Route 95, we finally found a restaurant on our side of the road. Two salesmen selling time-sharing vacations joined us.

"To be frank, honest, and candid, some of these scores are getting ridiculous," I said as I wolfed down my smoked swordfish. "What do you say we kick a few of these games off the Big Board?"

"Let's talk condos," Ed, one of the salesmen, said.

"What do you suppose caiman meat tastes like?" Max asked into his Boffo Burger Platter.

"That's disgusting," said Mercedes.

"It probably tastes like chicken," Fred, the other salesman, said.

"Everything tastes like chicken to you," Ed replied. "How about a little bungalow on Sanibel Island?"

"Take Galaxy Invasion, for instance," I continued. "It's no longer a game—it's an endurance test, a marathon. I'd just as soon go sit on a flagpole for three weeks."

"Get your fingers out of my fries," Max growled at Fred.

"Fred doesn't eat much these days," said Ed. "You know, I've got some nice, clean mobile homes in Clearwater."

"And Bounceoids," I went on. "We've got people who have to stop playing because they can't see the screen through all the extra ships."

"We already have a mobile home,"

Mercedes said sourly.

"Where's Sanibel Island?" Max asked.

"Hey, you said we could go to the Epcot Center!" Mercedes said.

"Life is short, kid," said Ed. "You gotta think of the future."

"So then it's decided," I said. "Galaxy Invasion and Bounceoids are off the board. And Alien Defense. And Armored Patrol. And Liberator, and Skyscraper."

"Don't call me 'kid,'" Mercedes retorted, "unless you want this sundae down your shirt."

"Feisty, isn't she?" Fred said.

"She has her days," I sighed.

"Now, this is science," I said as we drove toward the gleaming sphere that marked the Epcot Center. "This'll be educational."

"I can't wait to see what they've done with epiphytes," said Mercedes from under a seat, where she was playing with the caiman.

"I'm going on all the rides, too," Max said agreeably.

As we approached the entrance, a dozen or so more time-sharing salesmen emerged from the bushes. They walked stiffly toward us, pale, gaunt, arms ghoulishly outstretched. I turned my eyes at the horrible sight.

"When there's no more room in hell," Max intoned, "the salesmen shall walk the earth."

I downshifted through the horde, and prepared to enter the Experimental Prototype Community of Tomorrow.

"Where's Max?" asked Mercedes as we left the Kraft exhibition. "I kept looking for him while you were up on stage dancing with the animated food."

"I don't know," I said with my souvenir hat pulled over my eyes, embarrassed at having mistaken the show for a flashback. "He must have found an

The Computer Times

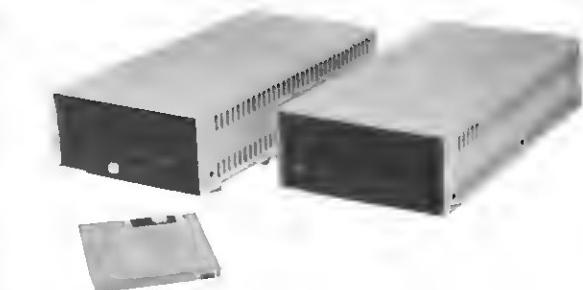
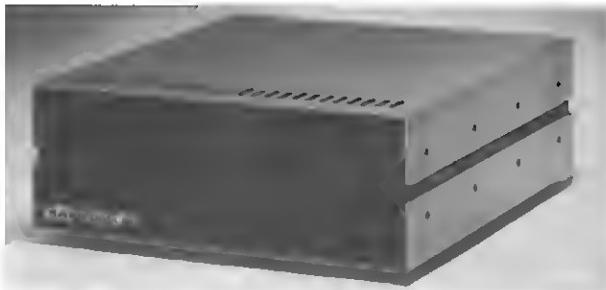
★ ★ ★ ★
FOUR STAR EDITION

business

section

D

VR DATA CORPORATION ANNOUNCES: THE PRICE WAR IS OVER !!



HARD DISK III*
5 MEG
WINCHESTER **995.**

5+5 Meg System	1590.00
15 Meg System	1449.00
15+15 Meg System	2299.00

10 Meg System	1249.00
10+10 Meg System	1999.00

*Hard Disk III includes up to 2 full height Winchester disk drives, heavy duty enclosure, disk controller, field proven power supply, I/O adaptor, and applicable cabling.

*Hard Disk III is available directly from the factory only.

HARD DISK III & HD-505 ADAPTOR MODULES:

IBM-XT* IBM-PC
APPLE II* APPLE IIe*
XEROX 820* XEROX 820-II*
FRANKLIN* LNW-80
TRS-80 MOD 1 LNW-II
TRS-80 MOD III TRS-80 MOD 4
OTHERS TO BE ANNOUNCED
*AVAILABLE 3RD QUARTER 1983

150.

Call Toll Free • 800-345-8102



VR data

(215) 461-5300
777 Henderson Blvd.,
Folcroft, PA 19032

VR DATA—WEST
Watonga, OK
1-405-623-8664

Published prices reflect cash discount. All prices are subject to change without notice. TRS-80 and TRSDOS are trademarks of Tandy Corp. Disk III and HD-505 are trademarks of VR DATA CORP.
8:30 am-7pm EST Mon-Fri, Sat 10am-3pm
CABLE "VRDATA" TELEX 845-124

All VR DATA products are tested, burned-in, and re-tested. We're so proud of our quality control that we offer an optional unconditional extended warranty covering full costs of parts and labor on all VR DATA products.

arcade."

We soon caught up with him—he couldn't go very fast with the luggage and the gas grill under his arm.

"Hey, guess what?" he asked, dropping a 35mm camera and a VIC-20. "I just bought vacations for all of us forever!"

"Huh?"

"Time-sharing! Don't you know anything? That's what Florida's all about!" he explained, sweeping an arm and nearly knocking over another sales rep. "We've got a beachfront cabana for one week a year till 2040!"

"My God," I gasped. "They got him. Look at his eyes."

"But don't they require a down payment?" asked Mercedes.

"No," he said, producing a sheaf of 14 or 15 signed contracts. "They'll bill me."

"Max," I interrupted in terror. "You have no money."

"I thought of that," he reasoned. "So I signed your old friend Winthrop's name to everything."

"Let's get some of these new high scores out of the way," I said as we ate supper. We seemed to be doing a lot of eating lately, which suited Max fine.

"Well, Kyle Hoyt, who lives right around here, sent a score for Dig Out," Mercedes said. "And he sent in high scores for Gauntlet, Missile Attack, and Outhouse.

"Thinks he's hot stuff, doesn't he?" Max grumbled.

"Now, now," Mercedes said. "You've still got the high score in Bable Terror."

Then there was Kevin Josephson of Chilliwack, B.C., who reported six high scores—in Rear Guard, Panik, Space Castle, Frogger, Crazy Painter, and Stellar Escort. Max was suspicious of all those nice round numbers, but we like to give people the benefit of the doubt.

"I'm tired," said Mercedes. "Let's get out of this place."

"Where to?" I asked.

"Well..." said Max, as he rummaged through his various contracts. "If we hustle down to Ft. Meyers, we can still catch a couple of days in our ca-

bana. Soak in some rays, do some shelling, set up the Cafe . . ."

"OK," I said. "But then we've got to head north. It's too humid down here for anything but caimans."

The salesmen were still milling about when we left. They'd overturned one car, and had an elderly couple in a Winnebago under siege.

"Don't look, Mercedes," I said. "This isn't something someone your age should see."

Naturally, she ignored my advice, and ogled the horrifying carnage.

"So what?" she gulped. "Doesn't bother me."

But she was strangely silent after that, and woke up with nightmares in the wee hours of the next morning.

"I wish she hadn't seen that," I said to Max later.

"The minions of reality stalk the borders of every fantasy land," Max said philosophically. "She's going to grow up sooner or later."

Still, the incident bothered me. I hope she never has to buy a used car. ■

TRS-80*

100% Radio Shack Equipment

SAVE A BUNDLE

Order Toll Free 1-800-874-1551

FLA Residents 904-438-6507 collect

EPSON, OKIDATA, CITOH, TABCO Printer Switches



SALES CO.

704 W Michigan Ave; P.O. Box 8098
Pensacola, FLA 32505

>189

*TRS-80 is a trademark of Tandy Corporation

The Big Board

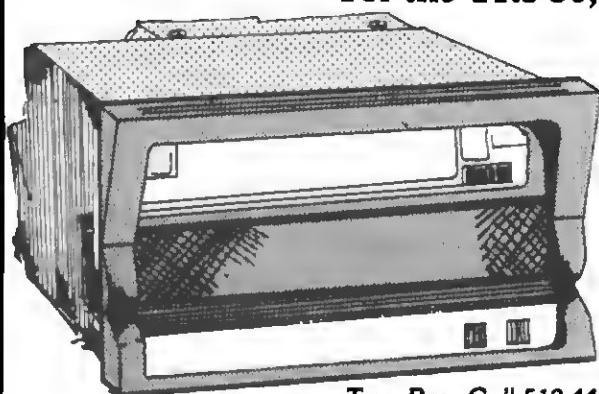
Apple Panic	38,120	Dave Westfall, N. Olmsted, OH
Attack Force	1,306,810	Johanna Bennett, Ft. Greeley, AK
Bable Terror	7,858	Mad Max
Barricade	17,520	Troy Scrapchansky, Uncasville, CT
Caterpillar	362,883	Alvah Werner, New Albany, OH
Chicken	8,922	Halfdan Hansen, Nelson, N.Z.
Cosmic Fighter	581,280	L. Ken Jackway, Phoenix, AZ
Crazy Painter	250,000	Kevin Josephson, Chilliwack, B.C.
Cyborg	99,960	George Heineman, Framingham, MA
Defense Command	126,170	Bette Dufraime, Bolton, CT
Demon Seed	94,210	Philip MacKenzie, Bloomfield Hills, MI
Dig Out	265,800	Kyle Hoyt, Titusville, FL
Dungeon Escape	2,028	Farhad Abrishami, Silver Spring, MD
Eliminator	474,950	Ron Johnston, Emporia, KS
Flying Saucers	1,786	Mark Fertig, Northville, MI
Fortress	187,600	Mark Brinkman, Emporia, KS
Frogger	100,000	Kevin Josephson, Chilliwack, B.C.
Galaxy Invasion Plus	1,113,600	Geordon Portice, Twining, MI
Gauntlet	52,570	Kyle Hoyt, Titusville, FL
Ghost Hunter	41,190	John Kane, Nelson N.Z.
Insect Frenzy	520,610	Darrien Ewaniuk, Vegreville, Alta.
Jovian	133,320	Mark Brinkman, Emporia, KS
Laserball	72,530	Neil Matson, Panama City, FL
Laser Defense	1,000,000	David Cameron, Prince George, B.C.
Leaper	35,410	Tommy Seriuik, Vegreville, Alta.
Lunar Lander	9,600	Nelson Kruger, Duarte, CA
Mad Mines	10,220	Gorman Miller, Titusville, FL
Martian Patrol	17,740	Kyle Hoyt, Titusville, FL
Meteor Mission 2	119,750	Bob Brown, Dallas, TX
Missile Attack	42,730	Kyle Hoyt, Titusville, FL

Monster Invaders	32,620	Troy Scrapchansky, Uncasville, CT
Olympic Decathlon	9,598	Matt Dossey, Ocala, FL
Outhouse	1,000,000	Kyle Hoyt, Titusville, FL
Paddle Pinball	3,980,310	Brian Gehrich, Quincy, IL
Panik	48,000	Kevin Josephson, Chilliwack, B.C.
Penetrator	345,510	George Heineman, Framingham, MA
Planetoids	56,450	Carl Pflanzer, Gillette, NJ
Rear Guard	73,290	Kevin Josephson, Chilliwack, B.C.
Robot Attack	143,250	Mark Fertig, Northville, MI
Scarfman	679,490	David Heyman, Conway, PA
Sea Dragon	552,890*	John Hope, Kingston, Ont.
Space Castle	52,700	Kevin Josephson, Chilliwack, B.C.
Space Intruders	14,030	Ron Johnston, Emporia, KS
Space Warp (Level 8)	261	Jer McLanahan, New Canaan, CT
Stellar Escort	625,000	Kevin Josephson, Chilliwack, B.C.
Strike Force	433,900	C. Athanas & N. Kincaid, Topsham, ME
Super Nova	2,138,710	Mark Fertig, Northville, MI
Swamp Wars	59,130	Farhad Abrishami, Silver Spring, MD
Temple of Apshai	390	Carl Pflanzer, Gillette, NJ
Time Runner	89,479	Mad Max
Venture	29,440	Farhad Abrishami, Silver Spring, MD
Voyager 1	833	Farhad Abrishami, Silver Spring, MD
Weird	17,120	Chris Athanas, Topsham, ME
Wild West	15,400	Gorman Miller, Titusville, FL

* Expert mode: 339,080 (David Smith, Kingwood, TX).

Gamer's Cafe readers are invited to submit their high scores, preferably with screen photos, for these and other Model I/III/4 games. Sorry, but we are no longer accepting entries for Color Computer games and, due to known bugs or ridiculously high scores, the following: Alien Defense, Armored Patrol, Bounceoids, Galaxy Invasion, Liberator, and Skyscraper.

MICRO DESIGN INTRODUCES **REMOVABLE** WINCHESTER HARD DISK SYSTEM For the TRS-80, IBM & Apple Computer



Tex. Res. Call 512-441-7890

1-800-531-5002

See our ads on pages 41, 183, 349

Starting At \$1299⁹⁵

MICRO DESIGN

6301 Manchaca Rd. Suite B • Austin, TX 78745

FEEDBACK LOOP

by Terry Kepner



Send any questions or problems dealing with any area of TRS-80 microcomputing to Feedback Loop, 80 Micro, 80 Pine St., Peterborough, NH 03458.

As the author of the Weather Forecast program (January 1983, p. 400), let me state that contrary to the "discovered error" in the May Debug (p. 26), the program works correctly. The error was in how Rea Plowman used the program.

First, some pertinent information about the program: It is important that the user input the barometric pressure value obtained at or near the location of the forecast, and that it is measured by a barometer adjusted to indicate the barometric pressure at sea level. Using a non-adjusted barometer, regardless of how expensive or accurate, results in inaccurate forecasts.

To properly determine the correct values to enter in the program follow these steps:

- Lightly tap the barometer and copy down the value indicated.
- Repeat this step an hour later.
- Compare the readings. If they differ by .05 or more the change is considered rapid. Less is considered slow and no change should be recorded.
- Wind direction should be recorded at the time of the second barometer reading, and is always counted as the direction the wind is coming from, not the direction it is blowing toward.
- Enter these values into the program and record the resulting forecast.

As you can see, the short, simple, and user-friendly program isn't really that simple. Use of this program by those uninformed in the fundamentals of using a barometer and determining wind direction can result in incorrect forecasts.

A.P.
Kenosha, WI

Thanks for the update; I appreciate your taking the time to clarify the proper use of your program.

I have answers for two readers' ques-

tions posed in the April 1983 issue.

First, for D.F. in Columbus (p. 380), here's how to use SuperScripsit with NEWDOS80 2.0:

- Load SuperZap and select the DFS function.
- Answer the file prompt with SCRIPSIT/CMD.
- Type in F,CD,90,52.
- After the cursor finds this byte sequence, modify it to 00,00,00.
- SuperScripsit now works with NEWDOS80 2.0, except for the display directory function. This isn't a problem since you can now access MINIDOS.

Second, B.H. in Brazil (p. 396), can be assured that the CP-500 is almost an exact duplicate of the Model III. The only differences I can find are: The main circuit board is mounted horizontally without any RFI shielding, the power supply is sturdier and incorporates a cooling fan, and there's a resident machine-language monitor in ROM that is invoked via the break and reset keys. I've been using Radio Shack software extensively on this computer for the last six months and have had no problems.

D.C.L.
Sao Paulo, Brazil

Thanks for the information.

The correct answer to D.R.'s question (March 1983, p. 414) is this: Find the start, end, and execution addresses for machine-language programs, CLOADM the program, but don't execute it. After it's loaded, type

PRINT 256*PEEK(487)+PEEK(488)

to get the start address. Then type

PRINT 256*PEEK(126)+PEEK(127)-1

to get the end address. And finally, type

PRINT 256*PEEK(157)+PEEK(158)

for the execution address. Now you can type

C\$AVEM"NAME",START,END,
EXEC.

M.R.
Englishtown, NJ
B.B.
Smithtown, NY

Boy, am I embarrassed about missing that one.

I'm responding to your question to those who've used EDTASM 1.0 and 1.1 (April 1983, p. 394). I first used EDTASM 1.0, but it only saves 200 lines of source code, as I discovered when I typed in a 400-line program.

I exchanged it for version 1.1 and have had no problems using it for the last 10 months except for an occasional bad load due to the use of uncertified tapes.

W.B.
Osceola, PA

I've encountered problems with EDTASM on my Model I. Everything works fine until it's time to reload the object code back into the EDTASM buffer to edit the program.

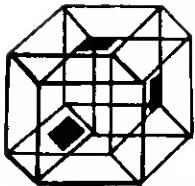
A service center told me my problem was that the code recorded after assembling wasn't object code, but was instead Assembly code. The Write command is used to store object code on tape.

J.S.
Thornton, CO

I have tried to use EDTASM 1.0 on my Model III, but it won't write system tapes. Any attempt to do so bombs the program. The manager of Radio Shack refunded my money and sent the program back to Fort Worth. To say the least, I'm furious with Radio Shack for their lack of interest in the needs of their computer owners.

R.B.
Nepean, Ontario

After 2 years of extensive research and development
XYZT Computer Dimensions, Inc is proud to announce ...



NICE™

the NEW INTERACTIVE COMPUTING ENVIRONMENT

NICE is nothing less than a comprehensive integration of all computing facilities — including DOS, numerous utilities, application programs, even games combined with menus, database, screens, libraries, reports — an interactive environment friendly to the first time user and the sophisticated systems intergrater alike. If you know what a turbo-charger can do for an auto engine, that is what **NICE** does for a computer. Clearly, it is the most exciting news to come along in software for the microcomputer.

**DO YOU KNOW HOW TO BOOT YOUR SYSTEM?
THEN YOU KNOW HOW TO TURN YOUR COMPUTER
INTO THE MOST POWERFUL USER FRIENDLY BUSINESS MACHINE!!**

NICE makes development and using software — EASY. Based on a new concept this state-of-the-art software gives you the interactive power until now found only on mainframes, but at micro prices. Put a powerful menu-driven command structure at your fingertips! Run word-processors, spell-checkers, spread-sheet programs, utilities, application programs without remembering command sequence or constantly checking the manuals. Everything you need is on the screen. Create your own applications and add them to the system — use menus, relational files, customized screens, special forms. In a matter of hours, you zip through the programming projects you usually expected to take months. All thanks to a modular, consistently designed system.

**IS YOUR WORDPROCESSOR WORKING?
THEN THOSE SCREENS OUGHT TO BE IN YOUR SYSTEM !**

Using a computer should not be difficult — no more complicated than driving a car. With **NICE** you are no longer required to know all of the intricate internal operations of the computer. Creation of all types of screens, menus, inquires and reports or customized forms is as simple as writing a letter — type it on your word-processor, save it to disk, and it is ready for use. You don't have to be a programmer — just a computer user.

It's **NICE** for you!

NICE system consists of:

Interactive Control & Programming Language (ICPL)	\$150.
Menu and Screen management facilities (MSF)	\$75.
Database facility (DBF)	\$75.
Forms and Report Writer (FRW)	\$75.
Library Support Option (LSO)	\$75.
Minimal NICE configuration — ICPL+MSF+LSO.	

Minimal hardware requirements — 2 disk TRS-80® mod I/III. System is compatible with NEWDOS/80®-LDOS®-DOSPLUS®-MULTIDOS® floppy or hard disk.

Check, M.O., C.O.D., VISA,
MC plus \$4.00 s/h.
Foreign orders — extra \$10.00



XYZT Computer Dimensions, Inc. ✓158
2 Penn Plaza, Suite 1500
New York, N.Y. 10121
(212) 244-3100

Order by Mail or Check Your Local Dealer

DEALER INQUIRIES WELCOME!

NICE	
File	Exit
Help	...
Please enter your user name and password. The system will then transfer you to your area.	
XYZT Computer Dimensions, Inc.	
Welcome to the Interactive Computing Environment! This is HELP PAGE #1. To enter you must now have physically entered the system. The interacton is presented here in following format:	
1. First level user 2. Using screen features 3. Using menu facilities 4. Using databases 5. Reports and inquiries Selection area <small>Remember, at any point you can press A to go back and return to previous data.</small>	
NICE interactive menu	
1. Utilities 8. Training aids 2. Letters 9. DB functions 3. Programs 10. Help 11. Utilities menu 4. Business apps 12. Database menu 13. Screen formats 5. Reports 14. Development 15. User-defined menu 6. Inquiries 16. Logoff Your selection: ... <small>ICPL 100% MSF - business apps</small>	
Letters	
1. Standard Letter 10. DB functions 2. Formatted 11. Edit screen 3. Programmed 12. Main enquiry 4. Print report 13. ... 5. Print mailing label 14. Send/receive letter page SP 6. Letter generator 15. New menu Your selection: ... <small>ICPL 100% XYZT Computer Dimensions, Inc.</small>	
Inquiries	
1. Customer info 10. Help menu 2. Reference info 11. Utilities menu 3. Order info 12. Database menu 4. Product info 13. Screen formats 5. Sales info 14. Development 6. User-defined info 15. User-defined menu Your selection: ... <small>ICPL 100% XYZT Computer Dimensions, Inc.</small>	
Utilities	
1. Disk access 10. Help menu 2. Processor 11. Edit screen 3. Memory 12. Main enquiry 4. Utilities 13. Database menu 5. DB access 14. Development 6. File access 15. User-defined menu 7. Print access 16. Screen formats 8. User-defined access 17. Utilities menu 9. Device access 18. Database menu Your selection: ... <small>ICPL 100% XYZT Computer Dimensions, Inc.</small>	
Development	
1. Basic editor 10. Help menu 2. Processor 11. Edit screen 3. Memory 12. Main enquiry 4. Utilities 13. Database menu 5. DB access 14. Development 6. File access 15. User-defined menu 7. Print access 16. Screen formats 8. User-defined access 17. Utilities menu 9. Device access 18. Database menu Your selection: ... <small>ICPL 100% XYZT Computer Dimensions, Inc.</small>	

FEEDBACK LOOP

I believe I know the source of A.L.'s problem (April 1983, p. 394), although in my case the problem usually occurred only when I had a long object code file to write to tape.

When writing the header record to tape and writing the first data record, EDTASM goes off and does some sort of calculation that takes almost two seconds. The result is a long inter-record gap between the first two records. This probably doesn't bother most TRS-80s, but in my old Model I on the CTR-80 the inter-record gap causes a problem. It appears that when the next pulse comes along after the gap, a circuit starts ringing. The result is that the first byte of the new record is garbled so that the computer doesn't recognize the record and hangs up.

I solved the problem two ways. First, I wrote a short loader program that ignores, but reports, errors in the first byte of a data record, which should be 3CH. I've found that many once unreadable tapes are now OK. The second solution was to move up to disk drives.

J.V.
McLean, VA

It seems that there are several problems with EDTASM 1.0 and 1.1. First, version 1.0 can't write more than 200 lines of source code to tape, and second, there are problems with object and source code files. The only solution for the first problem is to get version 2.0. The second problem is more difficult.

Make sure you're using EDTASM properly. There are two ways to save a file to tape. One is as a source code program, the other is as an object code program. A source code program uses the Write command and stores on tape a duplicate of your file in memory with all labels, line numbers, comments, and so forth exactly as stored in memory. If you want to add or edit the program you have to reload the source file. The source code can't be loaded into Basic with the System command. Source code is only to be used for creating object code and editing.

The object code file is the actual machine-code instructions of your program. This file is stored on tape after you issue the Assemble command. If any errors are discovered during assembly, you can still save the file to tape, but it bombs if you try to use it. EDTASM does not load object code programs into memory; it can only load

source code files. If you discover a bug in your object code program, you must use the source code file to make any changes to the program, and then reassemble and save the new object code program.

Finally, the overlong inter-record gap is a problem which I don't know how to solve, except to do as J.V. did and write your own loader program. For convenience, you may want to write a program that loads and then resaves the program without the overlong gap between records. Does anyone have a suggestion on how to handle this problem?

I recently upgraded my Model I to disk drives, but I bought two new slim-line TEAK 40-track drives. After several months of searching before buying the drives, I decided to start with TRSDOS. The Radio Shack stores were willing to sell me a disk and manual for \$35 (\$15 for the disk, \$20 for the manual), but I found a source, Total Access (P.O. Box 3002, Richardson, TX 75080, 214-458-1966), that was willing to sell both for only \$20. When I called them, they wanted to know what drives I had so they could patch TRSDOS accordingly. So, at no extra charge, I received a 40-track version of TRSDOS 2.3!

I'm just beginning to learn disk operations, but I haven't had any problems with their patched version of TRSDOS 2.3.

J.M.
Kettering, OH

What a coincidence! I was just finishing a program to patch TRSDOS 2.3 for 40-track operation when I read the letter from K.S. of Pittsburgh (May 1983, p. 381). I'm calling it VCT3540 and selling it for \$32.50. Anyone interested in converting from 35-track to 40-track operation can order it from Mysoft Computer Software, P.O. Box 417, Arroyo Grande, CA 93420, 805-481-3992.

L.P.
Arroyo Grande, CA

In response to K.S.'s question (May 1983, p. 381) about converting TRSDOS 2.3 to 40-track operation, Percom (211 N. Kirby, Garland, TX 75042) sells a program called Patchpak #4 which does this, but it also makes some patches to the operating system that makes it incompatible with your drives.

I converted TRSDOS 2.3 without making the additional changes to the operating system. Unless all the changes made by Patchpak are suitable and you have a two-drive system available for the conversion process, I suggest you contact me for a copy of my 40-track TRSDOS.

M.B.
Munhall, PA

I have a patch so that you can operate TRSDOS 2.3 with 40-track drives. If you'll forward my name and address to K.S., I'll be happy to provide him with the patch.

W.F.
Ft. Knox, KY

W.F., it's done! And thanks to everyone else kind enough to help K.S. out of his bind.

I own a Model I with the two-chip ROM set. With the following program:

```
10 A$ = INKEY$: IF A$ = "" THEN 10 ELSE  
PRINT ASC(A$): GOTO 10
```

it is possible to print out the ASCII codes for every key pressed except the shift-down arrow keys. Why doesn't the shift-down arrow return a value?

C.G.
Munich, West Germany

The Model I uses the shift-down arrow as a control key combination, since it doesn't have a separate control key. A control key doesn't have an ASCII value.

When you press the shift-down arrow keys, ROM interprets this as meaning that you want to type a control key (ASCII value from 1 to 26, keyed by pressing the appropriate letter of the alphabet, ASCII value 65-91). Thus, it waits for the alphabetic keystroke and subtracts 64 from it to get the control code value. In other words, if you press the shift-down arrow keys followed by the M key, the ROM returns the value 13 to your program.

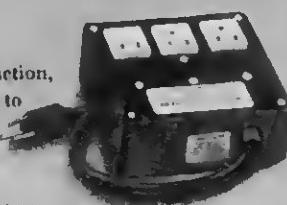
I have a Model I Level II with an LNW Expansion Interface (EI) and two disk drives. I've had three problems: the CPU to EI cable, the terminating resistors, or an easily corrected problem with the FD1771B chip.

I solved the cable problem by using

OUR ISOLATORS FOR YOUR PROTECTION

Prevents:

disk drive woes, printer interaction,
memory loss and damage due to
lightning or AC power line
disturbances.



Commercial Grade Isolators

ISO-1 3 Isolated Sockets	\$76.95
ISO-2 2 Isolated Socket Banks, 6 Sockets	76.95

Industrial Grade Isolators

ISO-3 3 Double Isolated Sockets	115.95
ISO-11 2 Double Isolated Banks, 6 Sockets	115.95

Laboratory Grade Isolators

ISO-17 4 Quad Isolated Sockets	200.95
ISO-18 2 Quad Isolated Banks, 6 Sockets	169.95

Circuit Breaker, any model (Add-CB)	Add 10.00
Remote Switch, any model (Add-BS)	Add 18.00

ESP® Electronic Specialists, Inc.

171 South Main Street, Box 389, Natick, Massachusetts 01760 • 159

Toll Free Order Desk 1-800-225-4678
MasterCard, VISA, American Express

PHASER BLAST...

Only you can stop them.

Three Eastern hovertanks advance over the wreckage towards you. As Phaser Blast's commander, you're the West's last chance in this exciting arcade game.

Dive and pulse forward. Fire phasers! A direct hit. But now their computers are locked onto you. Dance between their deadly laser beams. Fire and fire again.

More hovertanks appear, their laser cannons blazing. Suddenly your world goes white. There's a deafening explosion. You're falling fast. All you can do is aim for the first tank, and hope the battle goes better for your reserves.

But with Phaser Blast you'll always come back for more.

TRS-80® Models I & III (Level II), or PMC® computer.
0414RD, disk, sound, 16K, \$19.95.

*TRS-80 is a registered trademark of Radio Shack, a division of Tandy Corp.
*PMC is a registered trademark of Personal MicroComputers Inc.



YES! Send me _____ copies of Phaser Blast @ \$19.95. Please add \$2.50 Postage & Handling. VISA MC AMEX CHECK/MO Name _____ Address _____ City _____ State _____ Zip _____ Card # _____ Exp. Date _____ Signature _____

Instant Software

ORDER TOLL FREE:
1-800-258-5473
Rte. 101 & Elm St.,
Peterborough, NH 03458

*calling all TRS-80
MODEL IV and
MAX-80 owners*



an innovative word processing system

NEW 80 X 24 character word processing

- Model IV version works with TRSDOS 6
- full compatibility with 64 character version of Lazy Writer
- simple, powerful editor
- special purpose extensions - form letters, font program, math package, document-maker, etc.
- proportional spacing for many printers

CURRENT LAZY WRITER USERS

Call for update information

DEALER INQUIRIES WELCOME

Still only \$175.00

AlphaBit Communications, Inc.

Call Now!
MC/Visa
accepted

13349 Michigan Ave.
Dearborn, Michigan 48126
(313) 581-2896

• 476

FEEDBACK LOOP

an 18-inch cable connected from my TC-8. The cable grips the connectors so tightly that it almost can't be removed.

The terminating resistors are a real problem. The resistors are needed if edge connector J3 isn't used, but should be removed if J3 is connected to anything else. Moving the CPU-EI cable to J3 means that J4 is available to pick up static; this is no solution. I'm in the process of building a PC board with the resistors and a short cable so that I can put the resistors where needed.

The FD1771B problem: if the disks aren't present, the system hangs up. I installed a switch to take the chip out of service (described on p. 76 of the September 1981 issue of 80 Micro).

E.H.C.
Pioneer, CA

Thanks for writing.

In the February 1983 issue R.K. of Fallston, MD asked about formatting track zero on both single- and double-density disks (p. 410). Not long after reading that, I came up with the solution: use a forced interrupt command during format.

To format track zero, sector zero in single-density; Format track zero in double-density, issue the format in single-density command, and issue an immediate interrupt command after the data for sector one has been written to disk. Sector one is then in single-density mode and sector two in double-density.

You can format single-double-single-double, or any other combination, using a slightly different approach: Format the track in the density of the last sector; format tracks up to the next to last sector in the other density; and repeat, alternating the density and stopping the format (via interrupts) one sector less than the previous format until you reach sector zero.

N.M.
Stoney Creek, Ontario

An ingenious solution! Thanks!

I have an early Model I with an Exatron Stringy Floppy. My problem is with Basic: When I use Data and Read, the computer won't read past the first value. I've tried everything I can think of with no luck. Are my ROMs bad?

Can they be replaced? Do I have to use Model III ROMs?

G.M.
Kirkland, WA

It sounds like a problem that occurred with the earlier versions of the Model I ROMs. When Level II was introduced, it had a few bugs. Radio Shack went through several revisions before settling on the current two-chip ROM set. One of the versions, primarily associated with the revision G CPU board, had a flaw in the Read Data sequence. To correct this flaw, you have to issue the command POKE 16553, 255 before attempting to use the Read and Data statements.

Try doing this first. If it solves the problem, you don't have to worry about replacing the ROMs. If it doesn't, get a memory test program from your local computer repair center and have it check out the ROMs. The checksums given by the program should match the checksums listed for your ROM chips. If they don't match, you have to replace the ROMs.

The Model III ROM won't work in a Model I, so you needn't worry about that. However, I don't know how compatible the two-chip ROM set is with the Exatron Stringy Floppy. So call Exatron and ask them if it turns out that your ROMs need to be replaced.

I've been trying to contact The Bottom Shelf in Decatur, GA, but receive no response to my letters and phone calls. What's up?

G.P.
Glendale, WI

TBS went out of business over a year ago. I can't find any leads on the people who ran it. Sorry!

I'm writing in response to J.M.'s letter in the May 1983 issue (p. 384), and to anyone else having trouble loading the Checkers 80 program. After failing to get a successful load, I listened to the recording for faded tape, static, or hiss. What I found was a recording at a noticeably different frequency from other loadable tapes.

My solution is to physically alter the CTR-80 recorder to play at a different speed, which results in a successful load. To alter your tape recorder you'll need a small (30-watt) soldering iron, a

Phillips screwdriver, a voltmeter, two feet of insulated small gauge wire (#22 to #30) and a 50-ohm rheostat. You may also need a 6-volt lantern battery.

First, listen to the tape and compare it with another loadable tape. Determine if the recording is either too high or low a frequency. If it's too low you'll need the lantern battery.

Second, unplug all plugs and remove the batteries.

Third, remove the back of the tape recorder (two screws up front and one in the battery compartment), being careful not to break the battery compartment wires.

Next, find the cable leading from the motor (mine was brown) and follow it to where it's soldered to the circuit board. You should see one insulated wire and one uninsulated braided wire coming from the cable.

Now put the batteries in and press the play button. Use the voltmeter to find the positive end of the motor, press stop, and remove the batteries.

Remove the positive wire from the motor, and solder an 8-inch length of wire to the motor. Solder another 8-inch wire to the circuit board at the end of the negative lead and solder the center terminal of the rheostat to the positive wire.

If the frequency is too high, solder the other wire to either of the other two rheostat terminals, and skip the following instructions. If the frequency is too low, solder a short piece of wire to one of the other two rheostat terminals and attach the other to the positive terminal of the recorder. Connect the wire you soldered to the circuit board to the negative terminal of the battery. The motor should start turning. If it doesn't, double check your wiring. Remove the wire from the battery.

Wrap tape around the soldered wires and put the tape recorder back together, but don't put the screws back (reattach the wire to the lantern battery if you used it).

Put the cassette in the recorder and adjust the rheostat until it sounds right. When it does, rewind the tape and try to load it into the computer. Keep trying until it loads.

If you have a machine-language monitor, load and use it to load Checkers 80. With Checkers 80 in memory use the monitor to find the start, end, and execution addresses of the program, and then save it (after removing

THE SELECTRIC™ INTERFACE



Daisy wheel quality without daisy wheel expense.

You need the quality print that a daisy wheel printer provides but the thought of buying one makes your wallet wilt. *The Selectric™ Interface*, a step-by-step guide to interfacing an IBM Selectric I/O Writer to your microcomputer, will give you that quality at a fraction of the price. George Young, co-author of Microcomputing magazine's popular "Kilobaud Klassroom" series, offers a low-cost alternative to buying a daisy wheel printer.

The Selectric™ Interface includes:

- step-by-step instructions
- tips on purchasing a used Selectric™
- information on various Selectric™ models, including the 2740, 2980, and Dura 1041
- driver software for Z80, 8080, and 6502 chips
- tips on interfacing techniques

With *The Selectric Interface* and some background in electronics, you can have a high-quality, low-cost, letter-quality printer. Petals not included.

Credit card orders call TOLL-FREE 1-800-258-5473. Or mail your order with payment plus \$1.50 shipping and handling to: Wayne Green Inc. Attn: Retail Book Sales, Peterborough, NH 03458.

Dealer inquiries invited.

ISBN 0-88006-051-4

128 pages

\$12.97

Yes, I want *Selectric Interface* (BK7388). Enclosed is \$12.97 per copy plus \$1.50 for shipping and handling.

MASTER

VISA

AMEX

Card # _____ Expires _____

Signature _____

Name _____

Address _____

City _____

State and Zip _____

339B8S

All orders shipped UPS if complete street address is given.

DOT WRITER 3.0

More than a word processor! Typeset your text using any of our type styles (over 60) or create your own. TRS80 I/III, Epson, C.Itoh or compatible printers. Use your DOS and your editor. All new instruction manuals. Easy to use - best results! Now only \$79.95. Additional type styles \$29.95 per disk. Utility pack \$39.95. Read the reviews, they tell the real story! Call or write for more info! This ad was typeset with Dot Writer!

RCM COMPUTERS

✓273



221 HIRSHFIELD DR.

WILLIAMSVILLE, NY 14221



716-634-3026

VERSADBM

TRS-80 Models I, III, IV

VERSATILE DATABASE MANAGER SYSTEM!
COMPLETELY USER-DEFINEABLE!
MULTI-DRIVE CAPABILITY! VERY USER FRIENDLY!

SPECIAL FEATURES:

* SINGLE KEY COMMANDS AT MOST PROMPTS ! * SINGLE KEY REPEAT ENTRY OF DATA ! * ON SCREEN EDITING AND UPDATING OF ALL DATA ! * COMPLETE ERROR TRAPPING FOR EASY DATA ENTRY ! * COMPLETE DATA STATUS UPDATE FOR INSTANT VIEWING ! * WRITTEN IN BASIC FOR EASY MODIFICATION ! * DATA FILES CAN SPAN UP TO 8 DRIVES, 5" & 8" HARD DRIVES !

DATA:

* NUMBER OF FIELDS—1 TO 18 FIELDS ! * LENGTH OF FIELDS—1 TO 40 CHARACTERS ! * TYPE OF FIELD DATA—ALPHA OR NUMERIC ! * FIELD TITLES USER-DEFINABLE—1 TO 18 CHARACTERS !

REPORTS AND LABELS:

* USE AS MANY OR AS FEW FIELDS AS DESIRED ! * DEFINE PRINT POSITIONS FOR ALL FIELDS ! * START AND END PRINTING WITH ANY RECORD YOU DESIRE ! * SELECT BY ANY OF SEVEN SELECTION CODES ! * SELECT RECORDS BY ANY OR ALL FIELDS ! * SORT BY ANY FIELD !

CAPACITIES:

DEPENDING ON SYSTEM CONFIGURATION:
100 BYTE RECORDS : MODEL I, 4 DRIVES = 3000 RECORDS !
MODEL III, 2 DRIVES = 3000 RECORDS !
5 MEG HARD DRIVES = 50000 RECORDS EACH !

HARDWARE REQUIREMENTS:

TRS-80 MODELS I, III, IV—48K, 1 TO 8 DRIVES,
132 CHARACTER OR COMPRESSED PRINT PRINTER !

INTRODUCTORY PRICE ONLY
ONE OF THE BEST DATABASE MANAGERS
FOR TRS-80'S AVAILABLE TODAY !

TRS-80 Im Tandy Corp

ORDER NOW !

SHIPPED U.P.S. WITHIN 24 HOURS OF RECEIPT OF ORDER !
MONEY ORDER—CASH—CHECK (TWO WEEK DELAY)
C.O.D.'S ADD \$5.00 CA. RESIDENTS ADD 6% SALES TAX



THEESFT SOFTWARE COMPANY

1521 TEMPEST DRIVE

SUNRISE, FL 33323

1-305-734-2222

FEEDBACK LOOP

your modifications) to a new tape. The new tape should load correctly every time.

P.S.
Oregon, WI

Sounds like an awful lot of work. Rather than do all that, try what the next fellow did. If this doesn't work, then try P.S.'s solution.

I also had a problem loading Checkers 80, as well as Invasion Force, on my Model III. It seems, after listening to the tapes, that these programs were recorded at a slightly different speed than the other Radio Shack tapes. On the Model I it doesn't matter, but the Model III is more finicky and refuses to load the tapes.

My solution was to connect a wire-wound potentiometer across the remote jack on the recorder to slow the motor speed enough to read the program. I used a 5,000-ohm control with a patch cord ending in a mini-plug. Just wire one of the patch cord leads to the center and the other to one of the end terminals of the potentiometer. A few attempts may be necessary.

B.P.
Borden, Ontario

Your suggestion should work quite well for those people with tapes recorded at too high a frequency. Thanks.

M.G. of Parma Heights (May 1983, p. 388) wants to connect a Sperry-Remington 101 to a Model I. The 101 is an IBM Selectric in disguise, and the only way to use it is to add solenoids and circuitry. Escon makes a special version of their kit to convert the SR101. Since the kit costs about \$500, most people would be better off with an Epson or DMP printer.

For an off-the-cuff conversion of hexadecimal numbers, Basic is convenient. Just enter

A = 10:B = 11:C = 12:D = 13:E = 14:F = 15

Then, to convert 6E, type ?6*16+E. Of course, after doing this many times you'll eventually memorize hexadecimal notation and won't need the table. In the meantime, however, it's useful.

D.B.
Gainesville, FL

Thanks for the help.

This concerns the printer functions of the Radio Shack Inventory Control System (February 1983, p. 408). Although your method may work, Radio Shack published an article concerning that problem. It's the result of the design of their earlier line printers, and how a form feed was handled. On all current copies of TRSDOS, Radio Shack includes a utility called LPC/CMD which corrects this error. If you don't have LPC/CMD, you can get it from Radio Shack Computer Centers free of charge.

Even though this article was published in the Tandy Newsletter in 1981, they should include a note about this problem in their software packages sold today.

D.G.
Junction City, KS

You're right, LPC/CMD does correct the problem for people with older, or non-Radio Shack printers.

I have a Model I Level II 16K computer. I wanted to buy an Expansion Interface, but I now learn that they aren't available. Do you know where I can get one, or if someone else makes one that works on the Model I?

H.R.
Elkhart, IN

Rider Radio (Peterborough, NH 03458, 603-924-3911) still has a few units left. They are new 32K units with RS-232 boards, and are fully covered by Radio Shack's warranty. They cost \$550, shipping included.

LNW sells an expansion interface kit for the Model I. You assemble it yourself, putting on the components for the features you want, when you want them. Holmes Engineering also sells an expansion interface, as does Micro-Design. All three companies advertise in 80 Micro, so check their advertisements for features and prices.

I'm having serious problems with my Model III. It starts up with a high-pitched squeal from inside, similar to the sound a TV makes. After a few moments the image on the screen flickers and moves as if a strong mag-

netic field is present. What's happening, and how can I fix it myself?

B.G.P.
Aston, PA

Your squealing problem is in the picture tube, just like a TV. The insulation on the high voltage line to the tube is breaking down, causing the squealing noise. After a period of time a static charge builds up on the tube and generates a magnetic field that distorts the picture. This is a potentially dangerous situation. What you need to do is to get some "high voltage dope" from a TV repair shop and spread it on the high voltage line to your picture tube. The dope reinsulates the line, eliminates the leakage, and fixes your problem. If the repair shop gives you static about the dope, just explain the problem.

If the dope doesn't cure your problem, you'll have to take it to a repair shop. Since the problem is with the picture tube, just about any TV repair shop can do the job for you, and probably cheaper than Radio Shack.

I want to add disk drives to my Model III, and want to know what's the best configuration, 40- or 80-track? single- or dual-headed? single- or double-density?

Second, in what format are most disk programs sold (what track count, single- or double-density, etc.)?

Third, what's the best DOS?

Fourth, what brand of drive should I buy? And from whom should I get it? Also, who has the best disks?

Next, what are the differences between Level II and Disk Basic?

My friend and I have been exchanging programs we write. He has a single-density drive. If I get a double-density drive, will we still be able to exchange programs?

And finally, what's a locked disk? Is it one you can't copy?

P.H.
APO San Francisco, CA

I like short, simple questions like yours.

First, for drive zero you should get a double-density 40-track unit. This keeps you compatible with most disk-based Model III software, which is sold in that format. Many game programs are self-loading and won't boot in a drive other



of the hill!

It's a jungle out there, but the latest news on the Color Computer grapevine is that, above the swirling mists of confusion, more and more people are discovering the Rainbow.*

Now in its third year, the Rainbow has become the standard by which all other Color Computer magazines are compared. And no wonder! The Rainbow towers above the crowd, now offering more than 300 pages each month, including more than two dozen type-in-and-run program listings, a host of articles and in excess of 30 hardware and software product reviews.

We lead the pack in Color Computer publications and are devoted exclusively to the TRS-80® Color, TDP-100 and Dragon-32. We made our climb to the top by continually offering the best and the most by such well-known authors and



innovators as Bob Albrecht and Don Inman, and games from top programmers like Chris Lahm, Fred Scarbo and John Gaskins. The Rainbow offers the most in entertainment and education, home uses, technical details and hardware projects, tutorials, utilities,

graphics and special features like Rainbow Scoreboard and our new CoCo Clubs section.

For only \$22 a year, you get the keys to all the secrets locked in your CoCo!

Are you searching through the jungle of claims and clamor? Climb above it all. Look up. Find the Rainbow.

* Registered trademark of Tandy Corp.
© 1983 The Rainbow

The Rainbow 9529 U.S. Highway 42
502/228-4492 PO Box 209

Prospect, Ky 40059

YES! Sign me up for a year (12 issues) of the RAINBOW.

Name _____

Address _____

City _____ State _____ Zip _____

Payment Enclosed _____

Charge _____

VISA _____

MasterCard _____

American Express _____

Interbank # (MC only) _____

Card Expiration Date _____

Subscriptions to the RAINBOW are \$22 a year in the United States. Canadian and Mexican rates are \$25. Rates for subscribers outside the Americas U.S. \$37 air rate. U.S. \$45. All subscriptions are for one year. Back copies \$3. Single issue Please allow up to 5-6 weeks for first copy.

ISSN 0880-0658

THE ULTIMATE COMPUTER. THE NEW

LNW80 2 +

NOW:

MODEL 1, 3, and 4 COMPATIBLE!!

CP/M 2.2 and 3.0 COMPATIBLE!!

SOON:

IBM MS-DOS and CP/M-86 COMPATIBILITY!!

PLUS add up to 1 Megabyte of RAM!!

High Speed RAMDISK is coming!

SYSTEMS START AT \$1999

Includes: LNW80-2+, Hi-Res Green Monitor, One Disk Drive, CP/M 2.2, DOSPLUS, Microterm, Electric Pencil, Electric Spreadsheet, Chartex, and the LNW Small Business and Professional Accounting Software Series.

CALL US FOR THE BEST PRICES AVAILABLE
IN STOCK NOW! Ready for immediate delivery!

EXCELLONIX

(714) 973-1939 ** (213) 650-5754

WHAT REALLY IS INSIDE YOUR COMPUTER?



Find out in **INSIDE YOUR COMPUTER** from Wayne Green Books. I.R. Sinclair takes the cover off your computer and shows you what's inside and what it does. Novices will find information on:

- Microprocessors
- Input/output
- Interpreters
- Machine language
- Registers
- Logic operations

A look at programming ties it all together—how hardware and software make a microcomputer work. The information applies to any microcomputer system. A glossary of computer terms and an appendix on binary, decimal, and hexadecimal conversion make the book all the more valuable.

\$12.97, softcover, 109 pp., 5½ x 8½.

ISBN #0-88006-058-1

Call **TOLL FREE 1-800-258-5473** for credit card orders. Or mail your order with payment or complete credit card information. Include \$1.50 for shipping and handling.

Photocopy of coupon is acceptable for ordering.

Send to:
Wayne Green Inc.
Attn: Book Sales
Peterborough, NH 03458
Dealer Inquiries Invited

Yes, I want to know what's inside my computer!

Send me _____ copies of INSIDE YOUR COMPUTER. (BK7390) Enclosed is \$12.97 per copy plus \$1.50 shipping and handling.

MASTERCARD bank # _____ VISA AMEX

Card # _____ Expires _____

Name _____

Address _____

City _____ State and Zip _____

Send To: WAYNE GREEN BOOKS Attn: Book Sales Peterborough, N.H. 03458

UPS Delivery if complete street address is given

339B8I

FEEDBACK LOOP

than a 40-track double-density drive. As third and fourth drives, 80-track drives are fine but you'll have difficulties using them efficiently as drives zero and 1.

Whether the drive is single- or double-sided is a personal choice you'll have to make. From a software point of view, it doesn't matter. The primary advantage is that one double-sided drive is cheaper than two single-sided drives, and takes up less room. The disadvantage is that a double-sided drive costs more than a single-sided drive.

TRSDOS is the simplest DOS to use, but is unreliable as compared with the other DOSes on the market. I prefer MULTIDOS because it reads the disks of almost any other DOS. Very handy. It also has a super Basic for program writers, and maintains the most compatibility, in command syntax, with TRSDOS 2.3. In addition, it is one of the easiest systems to learn. My next choice is DOSPLUS, which has a lot of bells and whistles added, making it very versatile and fairly easy to use. NEWDOS80 and LDOS are designed

for professionals, and require hard study before you can begin to use them effectively.

Since you have a Model III, you'll need a drive-zero kit. The drive-zero kit contains the disk controller circuitry, mounting hardware, and power supply for the drives. You must have it before you can use drives. Your next drive, drive 1, won't need a case since it mounts inside the Model III case. You also should not need a power supply, since most drive-zero kit power supplies can power two drives. All you'll need is a bare drive. Which company you buy from is up to you. Your criteria should cover price, motor speed, stepping speed (the faster the better), and your proximity to a repair center. If you get a non-Tandy drive and there isn't a computer repair center close by you, you'll have real problems if your drive needs work in the future. You may end up having to remove it from your computer and sending it to the drive manufacturer. In that case, buying a Tandy drive makes more sense since you can just

take it to any Radio Shack store and have them send it to their repair center for you.

The primary differences between Disk and non-Disk Basic are in the disk I/O commands and in a few miscellaneous commands. The real power of Disk Basic depends on which DOS you get, since they all offer different features.

Exchanging programs with your friend will depend on your DOS. LDOS, NEWDOS80, MULTIDOS, and DOSPLUS are all capable of reading Model I disks in a Model III, especially if the disk was formatted by their Model I versions. Most of them, if the Model I has a double-density board, read Model III disks in Model I systems, but they require that both computers use the same operating system (Model I MULTIDOS reads Model III MULTIDOS disks, but only if the Model I has a double-density board). For more information on their transfer capabilities, call or write the manufacturers.

Finally, there are software techniques

NEWBASIC 2.0

Adds over 40 commands to Model I/III disk BASIC.

- Customize NEWBASIC—include only those commands you need.
- Over a dozen easy-to-use and powerful graphics commands (eg, DRAW, LINE, CIRCLE, PAINT).
- Produce sound for music & effects.
- Pre-defined and definable keys.
- Disk-based spooler/despooler.
- Execute strings, label lines, 2-byte PEEK/POKE, restore to any DATA line, block memory move, set hi-mem, and much, much more.
- 70 page manual & summary card.
- Only \$39.95! (+ \$2.50 shipping)

Check, money order, VISA, M/C, and C.O.D. (+ \$2) accepted. CA residents add 6% tax. Foreign orders (exc. Canada), \$5 shipping. US funds only. Both Model I & III versions on same disk. Requires 48K & 2 disk drives. (Not copy protected—personal backups OK.) Works with most major DOS's.



209 18th Street
Huntington Beach, CA 92648

Credit card & C.O.D. orders accepted 24-hrs
(manned 8-5, M-F): (714) 960-6668.

Dealer inquiries invited. 158

We show the way with our special interest publications.

- MECHANIX ILLUSTRATED COMPUTERS
- MECHANIX ILLUSTRATED PLANS & PROJECTS
- MECHANIX ILLUSTRATED HOME IMPROVEMENTS

We reach your specific target audience with a low out-of-pocket cost. And our readers buy because they want to, not because they have to. What better way to reach the hard core target market of do-it-yourselfers who are expected to purchase over a hundred billion dollars worth of goods in the next ten years.



We show the way.

1515 Broadway, New York, NY 10036
Call Edwin T. Knobloch, (212) 719-6572

BOOT ERROR DC

PLUG YOUR MOD II DISC EXPANSION UNIT INTO THE SeeBee UNIT AND FORGET ABOUT THE BOOT ERROR DC MESSAGE

"In my opinion, all users of older Model II's... should get a SeeBee as cheap insurance against the dreaded Boot Error."

R.H. Young, Editor/Publisher
Two/Sixteen - Jan-Feb 1983

"SeeBee performs as represented. It's a better mousetrap..."

C.R. Perelman
Product Review
80 Micro - July 1983

- Totally software transparent
 - Run your disk expansion unit only when needed
 - Eliminate ruined system diskettes
 - Compact 2 in. x 3 in. size
 - Simple plug in installation
 - Money back guarantee - 90 day warranty
 - \$64.50 plus \$3.00 shipping and handling
 - Indiana residents - add 5% sales tax
- PLEASE SPECIFY IF YOU ALSO HAVE A HARD DISK

MICROCOMPUTER PRINTOUT BASKET

- Use on any table
- Sturdy steel construction
- Beige epoxy finish
- Special power cord & signal cable retainer
- 12 inch \$22.50 18 inch \$24.50 plus \$3.00 shipping and handling

SYSTEMS ENHANCEMENT ENGINEERING, INC.

P.O. BOX 40215
INDIANAPOLIS, IN 46240
317-844-8817

✓63

✓54

that let you lock the data on a disk and prevent it from being backed up or copied. I consider locked disks to be a *caveat emptor*, buyer beware! Some software is worth having, even if you can't make back-up copies. You have to decide whether it's worth it.

I have a Model I with one disk drive. I need a disk directory program and would appreciate some advice. I have mostly TRSDOS disks, but also a few NEWDOS. Do any of the directory programs let you change the disk's name?

L.S.
Worcester, MA

I can't adequately answer your question since I don't use directory programs myself. I do know, however, that there are several that allow you to read non-TRSDOS disks and also let you change the disk name. You should check the advertisements in *80 Micro*. They'll give you more information about the directory programs. If you

have any back issues of *80 Micro*, check the review section. You may find a review that answers your question.

I plan to transfer some applications programs I've written in Basic on my Model III to an IBM PC. The IBM uses Microsoft Basic, as does the Model III. Both can save programs as ASCII files. The only differences I can see in the dialects are that IBM's Basic has a few enhancements that I don't need for my programs and the IBM doesn't have a PRINT@ command.

My programs don't use any machine-language routines, and use only three or four PEEKs and POKEs. Can I save my programs in ASCII format on the Model III and transfer them to the IBM PC via the RS-232 port? If so, what software do I need?

M.W.
Edison, NJ

Yes, you can make the transfer. For the Model III you'll need a terminal

program such as Omniterm (\$95 from Lindbergh Systems, 41 Fairhill Road, Holden, MA 01520, 617-852-0233). Since I don't have an IBM (yet), I can't recommend terminal software, but here are three to start you off: Westico (25 Van Zant St., Norwalk, CT 06855, 203-853-6880, \$175), Microcom (1400A Providence Hwy., Norwood, MA 02062, under \$100), and Saturn Consulting Group (147 West 26th St., New York, NY 10001, 212-675-7753, no price given). Others are listed in *PC World* (555 De Haro St., San Francisco, CA 94107).

You shouldn't have any trouble transferring the programs as long as they're in ASCII format. I've had no trouble doing this from my Model I to other computers such as the Apple, Color Computer, Model III, and so on.

I recently purchased a new DMP-500. It has many improvements over my LP V, and I had hoped the correspondence type font would allow me to write

BUSINESS SOFTWARE

IBM-PC, OSBORNE, NORTHSTAR,
RADIO SHACK, XEROX, EPSON QX-10

CP/M & TRSDOS

ALL SOFTWARE INCLUDES SOURCE CODE
PRICE INCLUDES FULL SUPPORT

= \$ = TAX/PACK = \$ =

TAX/PACK FOR PRACTITIONERS IS COMPLETE, COORDINATED, AND INCLUDES MOST-USUSED FORMS AND SCHEDULES. PRINTS ALL SCHEDULES, NO MASKS, NO DATA FIELD ENTERED MORE THAN ONCE. ALL DATA PASSED AUTOMATICALLY BETWEEN SCHEDULES AND 1040. FULLY SUPPORTED ALL YEAR. PARTIAL OR FULL SYSTEM, CAN BE USED FOR SINGLE OR MULTIPLE RETURNS. EXTREMELY FLEXIBLE. COMPUTING TAXES FOR OVER FIVE YEARS. STILL \$750.00 TIL SEPT. '83.

= \$ = ALSO: = \$ =

MAIL LIST MANAGER
UTILITY BILLING SYSTEM
REAL ESTATE APPRAISAL SYSTEM
PETROLEUM DISTRIBUTORS SYSTEM
RETAIL INVENTORY & BILLING SYSTEM

ANALYTICAL
PROCESSES

CORPORATION

835 Main Street or
P.O. Box 1313
Montrose, CO,
81402 or call
(303) 249-1400
VISA—M.C.

✓ 406



WORD
PROCESSING
ON YOUR
TRS-80
BECOMES
CHILD'S PLAY
USING SCRIPSIT
by
William James Haga

SCRIPSIT—one of the most powerful word processing packages available for the TRS-80 Model I or III. USING SCRIPSIT is for the first-time user and the expert, presenting procedures at every level of difficulty in simple-to-follow steps and exercises.

\$21.95

Look for these WEPCO products at your local computer dealer or bookstore. For more information or to order direct, call 415-595-2350 and ask for Wendy Moore (MasterCard and Visa orders only).

Wadsworth Electronic Publishing Company

6 Davis Drive, Belmont, California, 94002



✓ 305

FEEDBACK LOOP

office notes without having to use the DWII printer in another office. I didn't expect letter quality, but I was shocked to discover that the lowercase Y in the correspondence mode ruins the entire type font. The Y is offset vertically from the other letters in the font. It almost looks like a capital letter if you use it in words like "you" or "your."

Since I need to print letters with non-slashed zeros (which is available only in the correspondence type font), neither DMP-500 type font is acceptable for business purposes. If you have any suggestions for correcting this problem, please let me know. I gather that the character-generator chip would have to be reprogrammed to correct this problem.

*C.H.
Newport, RI*

You're right; it does mess up the type font. I find it incredible that Radio Shack would let such a mistake go uncorrected. Can anyone help C.H. with a new character-generator chip?

I'm writing to let you know that Tandy has released three new boards for the Color Computer: an MC board, a TDP board, and a board without any ID at all. I have the last one.

The board layout is different from the C, D, and E boards. My machine is a factory-installed 32K model with 64K chips. Is this normal? All four Berg jumpers say 16K/64K. Also, the technical manual (#26-3193) doesn't apply to my board. Is there a new one?

L.C.
Folsom, CA

Yes, it's normal for 32K machines to use 64K chips. You have the latest Color Computer board, designed to convert to 64K operation with the proper software. Radio Shack is currently working on a new Extended Basic ROM chip to let you access the full 64K RAM while in Basic. I've been told that the ROM will respond to the prompt PRINTMEM with 60,383. The remaining 4K is reserved for page-zero variables, text screen, and

high memory port addresses (RS-232, SAM chip, and so on). When we'll see this new software is guesswork.

By the way, high-level management at Radio Shack vehemently denies that the Color Computer is going to be dropped. The new MC-10, according to an internal memo sent to store managers, is not a replacement unit but a new low-end computer designed to compete with the Timex-Sinclair Spectrum.

My Radio Shack technician tells me that the only manual available is the one you listed. Even though he has a new 64K board in his shop, he doesn't have any technical information on it yet. When the updates are available you'll be able to get them through National Parts (900 East Northside Drive, Fort Worth, TX 76102, 817-870-5662).

I'm confused about the numerous anti-glare screens on the market today. Will the plastic screens stop X-ray emission and eliminate eye fatigue? Do slow- or medium-decay monitors work?

**Put your TRS-80
in touch with
IBM's universe**

Now you can have full IBM communications capability through one of innovative Data Technology's 1/2 magnetic tape interfaces.

Featuring industry-standard interfaces, rapid data transfer rates, full operating and command subsets and a wide selection of models and configurations, IOT's immigrants tape subsystems provide economical and reliable data/program interchange, 40M bytes of storage and direct cartridge. All IOT tape subsystems come complete and include tape transport, formattable intelligent controller, computer resident coupler, cables, documentation and software, but most importantly, they help put your system in touch with the IBM universe.

CDEM: Justice/Probation discounts available

30-80 Mission Blvd. • San Bruno, CA 94067
(415) 270-3990 • FAX: (415) 335-1710

Eastern Regional Office:
P.O. Box 1073 - McLean, VA 22101-1073
(703) 823-1151 • TWX: (710) 833-5833



**MASTER
HORSE
HANDICAPPER**



OVER 3 YEARS IN THE MAKING
1st complete handicapping program
that evaluates all variables

EVALUATES PH. M. RACING F. RM.

EVALUATES FH. M RACING F. HM.
GOLDBECK
J. COHEN
J. COOPERSON
L. COOPERSON
T. COOPERSON
Amplifies in GRAPHIC.
PRESENTATION IN FIGURES.

**ADAPTS TO ANY TRACK IN THE
WORLD**

WORKED
Quickly and easily by changing data statements
relating to local track records/jockeys and trainers.

COMPLETE INSTRUCTIONS INCLUDED

Program:

- A. Thoroughbred Maiden 5-25 19K
- B. Quarter Horse Maiden 5-25 19K
- C. Paint Horses 5-25 19K
- D. Thoroughbred Filly 5-25 19K
- E. Quarter Horse 5-25 19K
- F. Paint Horse 5-25 19K

With the MENU

Send check/money order/VISA/Mastercharge (include expiration date) to:

clude expiration date, etc.
Prof. Jones
1114 N. 24th St.
Bolse, Idaho 83702
Or call (208) 342-6939 M-F 8:00-3:00 MST

TERMS: Add 3 WEEKS for personal checks / Add 6.00 for C.O.D. / Add 4% for Idaho residents / Add 4.00 shipping outside U.S.A.

well with fast-action games? How do replacement monitors compare with anti-glare screens?

B.G.P.
Aston, PA

The only thing that stops X-rays is lead. Plastic puts up as much resistance to X-rays as glass does, which is to say none at all.

Eye fatigue is the result of staring at the blue-white phosphor of a monitor for several hours, and the inability to move in relation to that screen. For example, if you could move the keyboard back and forth from the monitor and tilt the monitor's screen up, down, left, and right as you can with some other computers, you would eliminate most eye-fatigue problems.

Phosphor-induced eye fatigue is a different problem. Your eyes are not designed for constant use with these particular light frequencies. They prefer instead frequencies closer to the middle of the visible light spectrum. That's why

many people hate fluorescent lights: The white light is slightly painful to them. But white phosphor is used because it's easy and cheap to apply.

Glare also enters the picture, since anything that makes the screen harder to read makes you strain your eyes.

The primary advantage to slow- and medium-decay monitors is reduced eye fatigue, which means longer periods of work without having to rest your eyes, greater productivity, and happier workers. The disadvantage is that you have to replace your current monitor with a more expensive one.

Green screens reduce eye fatigue by changing the monitor's blue-white light to green. They help, but replacing the monitor with a green or amber screen is better. The primary advantage to plastic green screens is that they're cheap by comparison with replacing a monitor. If you get a green screen, get one made of hard plastic, not molded plastic. The soft plastic is hard to clean without tearing it.

If you decide to get a replacement

monitor, get one with a built-in anti-glare screen; it'll cost a few dollars more, but as long as you're getting a new monitor you might as well do it right the first time.

Also, note that plastic green screen covers with built-in anti-glare are not made. Placing the two together means that you have to turn the video intensity of your monitor quite high, which eventually will burn out the phosphor in your monitor. The amber/green monitors are designed to prevent this.

Finally, using games with the slow- and medium-decay green/amber monitors isn't a problem. You will notice a slight tail (as the phosphor decays) behind rapidly moving graphics objects, but you quickly get used to it. And besides, the reduced eye fatigue more than makes up for this disadvantage. ■

Terry Kepner is a freelance writer and programmer, and the vice president of Interpro. He's been writing about microcomputers since 1979.

TRS-80 Model I is alive and well at the Micromint. We still have the expansion interfaces you need!

Disk-80 Expansion Interface



As featured in Clarcia's Circuit Cellar Byte Magazine, March 1981

Reviewed in March '82 "80 Microcomputing"

DSK01	Disk-80 Expansion Interface with 32K RAM A & T	\$330.00
OSK02	Disk-80 Expansion Interface with 32K RAM & Printer Port A & T	380.00
OSK03	Disk-80 Complete Kit with 32K RAM & Printer Port	275.00
OSK04	Disk-80 Bare Printed Circuit Board	48.00
DSK05	Printer/Power Supply Circuit Board	16.00

The Disk-80 Expansion Interface is the perfect peripheral for converting your TRS-80 Model I into a professional computer system. The Disk-80 controls up to four 35 to 77 track mini-disk drives, and contains a hardware date separator which substantially increases the reliability of data transfers. Attaches to the CPU/Keyboard connector and comes complete with mini-disk controller, 32K expansion memory, power supply, optional Centronics compatible printer port, real time clock and buffered bus expansion connector.

"Reviewing Disk-80 is almost incongruous, because any comments can be summarized with the sentence, 'It works.' Dennis Bathory Kitsz, 80 Microcomputing, March 1982.

All interfaces are Radio Shack hardware and software compatible and carry a 50 day warranty including parts and labor. All units include user's manual, power supply & auxiliary TRS-BUS connector for future expansion.

Dealer Inquires Invited

N.Y. State residents please add appropriate sales tax.

To Order: Call Toll Free: 1-800-845-3479
(In N.Y. State Call: 1-516-374-6793)

For Information Call: 1-516-374-6793



MICROMINT INC.
561 Willow Avenue
Cedarhurst, NY 11518

Comm-80



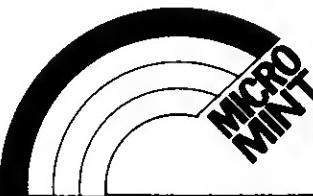
As featured in Clarcia's Circuit Cellar Byte Magazine, May and June 1980

The COMM-80 is the only interface you need to turn your TRS-80 Model I into a time sharing terminal with provisions for a printer. The COMM-80 combines the most used features of the RS expansion interface in a low cost unit containing a built-in RS-232-C interface, a full 8-bit parallel port and a 40 pin bus connector for future expansion. Terminal software is included at no extra cost.

- RS-232-C Serial output port (50-19200 baud) with standard DB25 connector.
- Centronics compatible parallel printer port (34 pin)
- 40 pin card edge connector for bus expansion
- Connects directly to CRT terminals, modems, printers, other computers.
- Includes case, power supply & interconnecting cable.

CM01 COMM-80 Serial/Parallel I/O Interface A&T \$150.00

TRS-80 is a trademark of Tandy Corp.





Lots of you write urging me to include more business programs on Load 80. This month, I did just that. This issue's theme is business, and Load 80 offers some intriguing applications.

The magic of successfully automating your company lies in finding a program that satisfies your requirement. Some of this month's programs may be just what you need; some may not. How do you decide?

You should begin by defining what you need the computer to do. Consider what you currently do manually. Do you send out large mailings? A data-management system can create and sort your mailing lists. Do you want the computer to print your mailing labels?

Analyze your business needs

You must select software compatible with your printer.

How do you keep track of your inventory? The right program can predict your needs and encourage low overhead by reducing your on-hand merchandise.

Do you need special reports on a regular basis? Do you handle a lot of correspondence? A good word processor is a must.

Additionally, you must examine your business's projected growth over the next year, five years, and even 10 years. The software you choose must keep up with your growth.

The computer's role in business management is handling information. A well-chosen system provides up-to-date reports faster than you can generate by hand, increases productivity, and improves your use of capital thanks to more efficient information-handling. In other words, the computer helps you coordinate information.

The small-business computer system consists of three parts: the computer (hardware), programs (software), and support (liveware). As a TRS-80 owner, you've already made your hardware choice.

Your software choice should take into consideration your company's needs as well as the people who will work with the program. If you're going to run the computer yourself, you should realize that data entry could take a lot of time that might be more profitably spent. If you plan to train an employee to run the computer, the program must be well documented and easy to use.

You should also analyze the software to see if it needs modifications for your particular business and whether you can make those modifications yourself. Commercial business applications do standardized jobs; if your company handles those jobs in an unconventional way, you need to customize the program.

Not all the programs we've included this month will help you. But they give you a chance to see what a computer can do for your business. Think carefully about whether you need each program in your business before you incorporate it.

Index	Page	Article	File Spec	Comments
Side A				
1	74	The Business of Planning	MONTE/BAS	none
2	128	Project Assessment Technique	PAT/BAS	none
3	184	Spacemap	SPACEMP1/SRC	Ed/Asm
Side B				
4	230	Talk to the Big Guys	UT1/SRC	EDTASM*
	230	Talk to the Big Guys	UT2/SRC	EDTASM
	230	Talk to the Big Guys	UT3/SRC	EDTASM
	230	Talk to the Big Guys	UT4/SRC	EDTASM
	230	Talk to the Big Guys	UT5/SRC	EDTASM
	230	Talk to the Big Guys	UT6/SRC	EDTASM

*EDTASM is a Radio Shack product.

September 1983 disk Load 80 directory.

Index	Page	Article	File Spec	Comments
Side A				
A		Copyright	COPYRGHT/BAS	none
B	74	The Business of Planning	MONTE/BAS	none
C	128	Project Assessment Technique	PAT/BAS	none
Side B				
UT1	230	Talk to the Big Guys	UT1/CMD	system*
UT2	230	Talk to the Big Guys	UT2/CMD	system*
UT3	230	Talk to the Big Guys	UT3/CMD	system*
UT4	230	Talk to the Big Guys	UT4/CMD	system*
UT5	230	Talk to the Big Guys	UT5/CMD	system*
UT6	230	Talk to the Big Guys	UT6/CMD	system*
DEA	184	Spacemap	SPACEMP1/SRC	Ed/Asm

*These six programs are already assembled. Load them as System files to a disk. Read the instructions in the article to create the executable command file.—Eds.

September 1983 cassette Load 80 directory.

Load 80 Subscription Notice

Load 80 circulation is handled here in Peterborough. If you have a problem with your Load 80 subscription, please notify Lori Eaton at 80 Pine St., Peterborough, NH 03458. Some people contact 80 Micro's fulfillment company in Farmingdale, NY, with their Load 80 problems; this delays our reply by about

four weeks. And that's a drag for all of us.

Load 80 Complaints and Questions

If you have technical problems with any Load 80 program, please write or call me. If I don't have the answer, I'll find it. Keep those cards and letters coming! ■

Month	Page	Article	File Spec
August	246	Kings & Castles	INSTRUC
	246	Kings & Castles	KINGS
	110	Rat Maze	RAT
September	30	The Color Key	EXPGRAPH
October		Physically Astronomical	TIME WEIGHT SSTARS WSTARS SPSTAR FSTARS

Color Load 80 directory.

ANNOUNCING: CLEANER 80

The System That Makes Your Cleaning Kit Worth 15 Times The Price You Paid For It.

Cleaner 80 is a software program designed to give you your money's worth — and more — when it comes to cleaning the disk drive head of your TRS-80 computer.

With this system, you can get up to 40 cleanings out of each disk drive head cleaning kit — instead of the 25 cleanings specified by the manufacturer. That's 15 times the number of cleanings you would normally be able to achieve.

Order yours today. Please specify whether you need the TRS-80 Model 1 or TRS-80 Model III version.

299⁹⁵ Cleaner 80

Disk Drive Head Cleaning System

To order write:
 Cleaner 80
 Disk Drive Head Cleaning System
 Macro-Systems Software
 P.O. Box 1734
 Wichita, Kansas 672-1734
 Call collect 316/264-3144

MULTI-USER SOFTWARE

PACKAGES AVAILABLE FOR **TRS-80 MODEL 16**

\$500.
per package

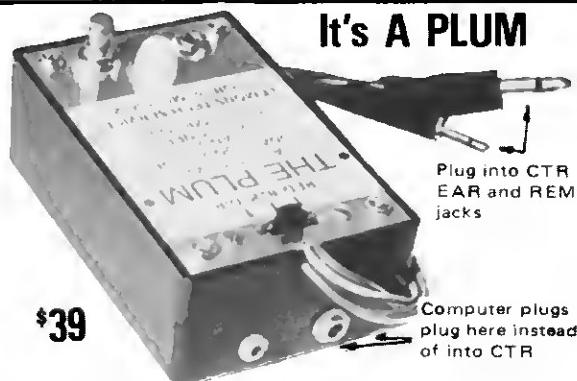
Available for TRS-80
Model 12 & Model 11
Single user

- General Ledger
- Accounts Payable
- Accounts Receivable
- Payroll
- Inventory / Invoicing
- Job Costing

1-214-341-9874

THE PROGRAMMER & ASSOCIATES INC.
10802 Forest Lane, Suite 110
Dallas, Texas 75243

248



No more volume juggling when you SYSTEM and CLOAD. No more plug pulling either...with built-in audio and built-in CTR motor pushbutton you can find and position pgms with ease. Put silent 'marker' gaps at the touch of a button too. Plus hear what's happening as you load and save.

The new PLUM (power-loader-universal-model) works with most CTRs incl. R/S CTR 80, 80A, 40, 41, CCR81 and others. Install in seconds.... just plug between Mod 1/III/4 and CTR. Works all bauds including =kwik=. No line cord. Auto on-off...standard 50¢ battery lasts for months. Life warranty on loading module. Money back guarantee of satisfaction.

LEMONS TECH

Order PLUM by name...\$39.00
Phone or write,
Postpaid except
add \$4 overseas
air. Add \$3 cod

325 N. Hwy 65
P.O. Drawer 429
Buffalo, MO 65622
(417) 345 7643



Reader Service Number	Page	Reader Service Number	Page	Reader Service Number	Page	Reader Service Number	Page
374 ALPS	6	262 DFW Computer Center	18	477 LowerCo Inc	325	80 Program Store, The	177
443 AString Systems	204	19 Data Display	301	115 Lynn Computer Service	289	248 Programmers & Assoc Inc, The	321
107 Aardvark Ltd	245	531 Datatime Systems	336	393 MCS Software	275	143 Progressive Electronics	329
356 Adel Computer Mart	295	563 Datascan Inc	345	398 M.E.S.C.	265	564 Prompt Doc Inc	352
82 Aerocomp Inc	138, 139	116 Data Services Inc	197	128 Macro Systems Software	321	95 Prosoft	341
136 Alien Gander Software	261	98 Data Systems	336	241 Marathon Software	52	98 Prosoft	19
517 Alien Gander Software	193	140 Data-Timers Company	340	146 Master Electronics Inc.	47	194 Quanis Systems	166
487 Alpha 100	91	342 Datetek Inc	341	513 Mechanix Illustrated	316	273 RCM Computers	362, 313
476 AlphaStar Communications	311	387 Digital Images	330	199 Mega Byte	270	402 RDS Software	246
473 Alpha Byte Computer Products	201	204 Diskette Connection	178, 179	461 Memory Merchant	203	76 R&S Software	134
17 Alpha Products Co.	13, 15, 17	441 Diskette Junction	111	559 Metrologic Instruments Inc	348	296 Rainbow, The	315
110 Amdek Corporation	209	5 Diskette Junction	113	215 Meyer's Place	240	401 RAMparts	151
217 American Small Business Computers	62	62 Displayed Video	198, 199	149 Micro Architect Inc.	165	145 REMarkable Software	147
540 American Software Club, Inc.	233	* 80 MICRO	68, 67, 99, 162, 163, 195,	247 Micro Productivity Technology Inc.	23	128 REMsoft Inc.	242
258 Ammicro	339	259, 275, 279, 291, 326, 349	40, 295	171 Micro Control Systems	31	518 Rizzo Data Systems	151
406 Analytical Processes Corp.	317	216 EAPCo/Gold Plug	151	14 Micro Data Supplies	9, 11	486 Rocky Mountain Software	121
141 Antek Software Products	49	* Early Games	111	426 Micro-Design	41	213 68 MicroJournal	327
* Ann Arbor Precision	210	154 Eigen Systems	311	* Micro-Design	25	432 SRS Solutions	349
40 Apparit Inc.	53	158 Electronic Specialties	226	463 Micro-Design	183	35 SID	142
566 Applied Creative Technology	344	125 Elite Electronic Industries	348	429 Micro-Design	307	340 SLR Systems	119
399 Applied Microsystems Inc.	69	574 Evans Specialty Company	315	76 Micro-Design	349	* Software	223
229 Argonaut Electronics	274	* Excellence	133	573 Micro-Design	338	142 Sales Data Inc.	150, 328
514 Arland Computer Systems	234	454 Far West Systems & Software	345	132 Micro-80 Inc.	165	* Sandpiper Software	193
383 Astro-Sir Enterprises	336	569 Flipp Track Learning Systems	301	161 Micro-Grip Ltd.	193	203 Scientific Engineering Lab	174
334 BASF Systems Corp	226	214 Fort Worth Computer	348	419 Micromatch	332	510 Scott Tasso Associates	326
152 BCCOMPACO	103	567 Fourtree Products Company	94	157 Micro-Images	101	431 Scripti Software	171
300 B Enterprises	269	262 Frank Hogg Laboratory Inc	204	464 Micro-Labs Inc.	176	363 Shawmut Systems	165
585 B.T. Enterprises	348	185 Good Lyndon Data Systems	217	90 Micro Mainframe	135	102 Silverwave/Cloud	60
74 BV Engineering	268	358 Grindasys	299	96 Micro Management Systems Inc.	109, 215	12 Smartek Computer Products	115
556 BV Engineering	354	298 Gtek Corp.	244	162 Micro-Mega	295	162 Smartek Computer Products	199
184 Baudy House Computer Products	250	267 H.A.K. Workshop	117	117 Microtron Inc.	319	372 Solis Systems & Consulting	273
243 Bay Technical Associates Inc	204	9 H & E Comptronics	83, 85, Cover, Gatefold	* Micro Price	97	492 Soltrands	42
570 Beta Enterprise Inc	354	359 Harley D. Wilbur	332	546 Micro Projects Engineering	157	116 Soltronics	147
25 Beta Enterprises Inc	349	356 Holman D.P. Service	166	312 Microsite Co.	122	57 Softshell	119
106 Binary Devices	262	153 Holmes Engineering Inc	78	562 MicroSmith Computer Technology	354	289 Software Guild	126, 127
381 Bodex Corp.	107	552 Horizon Software Systems Inc	350	526 Micro Software Systems	73	327 Software Support	58, 59
* Bottom Line	26	* HOT Coco Subscriptions	35	319 Micro Solutions Inc.	143	575 Solectronics	363
165 Briefcase Portable	204	175 How Software	156, 333	78 Micro Systems Software Inc.	CII	276 Solutions Inc	119
532 Brum Electronics	214	* I/O Tech	338	380 Microfiche Experts Inc.	327	325 Solutions Inc	271
236 Business Software Team	301	556 Infocom Inc.	344	546 Microwaves Computer Products	274	282 SonSoft	240
64 California Word Exchange	123	564 Inland	145	* Midwest Computer Wholesale	173	119 Spectral Associates	114
279 Canadian Micro Software	183	551 Inmac	345	137 Miller Microcomputer Services	236	92 Spiral Enterprises	132
466 Check-Mate	141	560 Inmac	350	350 Misosys	353	338 Strobe Inc.	81
571 Chemtronics Inc.	354	377 Innovative Data Technology	318	577 Misosys	348	551 Strobe Inc.	338
579 Chope-Stevens Paper Co.	350	578 Instant Software	354	582 Modular Software Associates	316	71 SubLogic Communications Corp.	170
103 Chromasette Magazine	44	Instant Software	351	* Mumford Micro Systems	117	456 Sunlock Systems	173
448 Coleman Computer Services	247	Conquer That Mountain	351	591 NPS Schools	155	584 Sybex	344
252 CompuAdd Corp	63	596 Music Teacher	279	533 NEBS Computer Forms	344	174 Syracuse R & D Center	349
455 Compukit	342, 343	596 Phaser Blast	311	584 National Distribution Center	353	63 Systems Enhancement Engineering	301, 316
168 Compu-Quote	174	587 Typing Teacher	151	256 New Classics Software	161	100 Systems Group, The	287
366 Compusoft Publishing	61	351 Institute for Scientific Analysis	212	259 New Classics Software	334	208 3M	27
120 Computer Applications United	257	234 Int'l Communication Experts	238	238 Nocona Electronics	33, 124	189 Tab Sales	306
139 Computer Case Company	105	470 Int'l Software Sales Inc.	204	54 Nodivill Software	326	70 Taranto & Associates Inc	175
133 Computer Discount of America	84	463 Intra Computer	354	508 Ocean Inc.	183	440 Tech Data Corp.	327
540 Computer Entrepreneur Publishing Co.	206	566 Irish Magnetic Industries Inc.	338	469 Omnicom Inc.	144	144 Texas Computer Components	275
357 Computer Friends	63	101 J & M Systems	233	36 Omnisoft Research	352	58 Texas Computer Systems/Producer	36, 37, 241
420 Computer Peripheral Resources	21	126 J.M.G Software Int'l	237	195 Omnitrek Computers Int'l Inc	147	320 Today's Future	181
18 Computer Plus	268	121 J.V.B. Electronics	273	206 Options-80	270	81 Total Access	313
453 Computer Shock	267	534 Jameco Electronics	297	151 Orion Instruments	145	22 TreeSoft Software	313
109 Computer Shock	267	536 Johnson & Johnson	118	20 PBH Computer Products	261	467 Trimtek Company	66
581 Computer Shock	354	465 Kalpico Electronic Co Inc	275	433 PCD Systems	219	489 Triple-D Software	26
39 Computer Shopper	8	331 Kredit	173	563 PMC Industries Inc.	362	522 TwoSixteen magazine	328
244 Computer Store	167	218 Kuzel Computer Software	150	207 Pacific Exchanges	270, 330, 349	332 United Software Associates	63
27 Compulex	167	156 LEDS Publishing Company Inc.	169	122 Pan American Electronics	145	417 Universal Data Research	169
576 Comtex International Inc.	340	30 LNW Research Corp.	7	314 PolTek	78	10 VR Data Corp.	125, 306
557 Comtec Information Systems	354	31 LNW Research Corp.	228	* Percom Data Company	3	561 VR Data Corp.	352
406 Consolink Corporation	51	32 LNW Research Corp.	8	568 Peripherals Inc.	360	169 Van Horn Office Supply	336
68 Contract Services Assoc	85	33 LNW Research Corp.	228	124 Perry Computers	345	* Vespe Computer Outlets	149
105 Cosol Inc.	300	268 L/R Software	330	176 Personal Computer Products	158	335 Virginia Micro Systems	336
45 Cornucopia Software	79	462 Langley St. Clair Inc.	43, 54, 55	238 Personalized Computer Paper	349	305 Wedgeworth Electronic Publishing	317
* Cosmopolitan Electronics Corp.	263	472 Leading Edge Products Inc.	323	508 Phone Line, The	159	* Wayne Green Books	131, 224, 261, 276, 277, 278, 299, 313, 335, 307
578 Comtex International Inc.	340	560 Leading Edge Products Inc.	350	290 Pickles & Trout	57	228 Western Micro Systems	22
187 Cottage Software	206	515 Lemons Tech Services	321	180 Pioneer Software	168	179 Western Operations	197
199 Creative Computer	47	* Level IV Products Inc.	207	300 Powersoft	111	226 William A. Fink	239
562 Crest Software	363	75 Lichen Software	163	315 Powersoft	299	337 WittSoft	279
223 Creal Software	273	135 Lindbergh Systems	45	11 Practical Peripherals	335	158 XYZ Computer Dimensions Inc.	309
572 Custom Software Services	344	251 Logical Systems Inc.	89	260 ProfAm Software	318	158 York 10 Computerware	47
* DEC Computing	174	237 Logical Systems Inc.	211	449 Prof Jones	211		

For further information from our advertisers, please use the Reader Service card.

TRUNKS FOR THE MEMORIES.



Introducing the most logical place to store Elephant Memory Systems® (or lesser brands of disks). The Trunk.

With its alphabetized library index, you can file or retrieve up to 60 disks, instantly.

The Trunk is made of durable molded plastic with a hinged, one-piece lid, to keep disks safe from dust, dirt, and other detriments which disks despise.

And, it's portable. Because the lid doubles as a carrying handle so your Elephant Memory Systems® disks can go anywhere you do.

There's a model for 5 1/4" and 8" floppies, as well as a cassette-and-game file and a special Atari® version.

So if you're looking for the best disk storage system on the market ...

The Trunk is an open-and-shut case.

THE TRUNK. ENDORSED BY ELEPHANTS.

Elephant Memory Systems® Disks

A full line of top-quality floppies, in virtually every 5 1/4" and 8" model, for compatibility with virtually every computer on the market. Guaranteed to meet or exceed every industry standard, certified 100% error-free and problem-free, and to maintain its quality for at least 12 million passes for over a life-time of heavy-duty use!

Marketed exclusively by Leading Edge Products, Information Systems and Supplies Division,
55 Providence Highway, Norwood, MA 02062.

Dealers: Call toll-free 1-800-343-8413; or in Massachusetts, call collect (617) 769-8150



FUN HOUSE

Letters and Numbers

```
100 REM * REPEAT * TRS-80 LEVEL II AND COLOR BASIC 4K
110 REM * FUN HODSE / SEPT. '83 /R.RAMELLA
120 CLS
130 AS=AS+INKEY$ 
140 IF LEN(AS)>1 THEN AS=RIGHT$(AS,1)
150 IF AS<>" " THEN PRINT AS" ";
160 GOTO 130
170 END
```

Repeat

```
100 REM * LETTER PIND * TRS-80 LEVEL II AND COLOR BASIC
110 REM * FUN HOUSE / SEPT. '83 /R.RAMELLA
120 CLS
130 CLEAR 400
140 AS="ABCDEFGHIJKLMNPQRSTUVWXYZ"
150 BS=AS
160 A=RND(26)
170 ZS=C0RS(64+A)
180 BS=LEFT$(BS,A-1)+" "+RIGHT$(BS,LEN(BS)-A)
190 PRINT @ 0,B$;
200 PRINT
210 PRINT
220 DS=INKEY$
230 IF DS="" THEN 220
240 IF DS>ZS THEN PRINT "NO -- "; ELSE PRINT "YES -- ";
250 PRINT 2S
260 FOR T=1 TO 750
270 NEXT
280 CLS
290 GOTO 150
300 END
```

Letter Find

```
100 REM * ABC * TRS-80 4K LEVEL II AND COLOR BASIC
110 REM * FUN HOUSE / SEPT. '83 /R.RAMELLA
120 CLS
130 N=108
140 Z=0
150 A=65
160 AS=INKEY$ 
170 PRINT @ 448,"SCORE: ",N;
180 IF AS<>" " AND AS<>CHR$(A) THEN N=N-1: B=B+1
190 IF B=3 TBEN B=0: PRINT @ 360,CHR$(A);: FOR T=1 TO 500: NEXT
T: PRINT @ 360," ";
200 IF AS<>CHR$(A) THEN 160 ELSE PRINT @ Z,CHR$(A);: A=A+1: Z=Z+
1
210 IF A=91 THEN PRINT: PRINT: PRINT "YOU DID IT!": END
220 GOTO 160
230 END
```

ABC

by Richard Ramella

September is back-to-school month. I go back to Clown-Around University to work on my degree in Funhouseology, and you go back to the next higher grade.

This is kind of a sad time for some people who get left behind—the little brothers and sisters of the world. It will be lonely for them.

Before I burst into tears, let me say that I've done something about this situation. I have some programs you can take home for the kids who haven't started school yet.

All these programs have a few goals: learning the alphabet and numbers one to nine, adding numbers up to five, and learning the keyboard for typing. The programs are short.

Some work in both Level II and Color Basic. Others have separate Level II and Color Basic listings. In all programs, line 100 indicates for which sys-

The Key Box

Model I and III
Color Computer
4K RAM
Level II Basic
Color Basic

tems the listings are meant. Look closely to be sure you're typing in a program that fits your machine.

Now, I'm not an educator; I'm just a poor old fun house attendant. But I do know a few things about little kids and learning and computers.

First, the programs here leave out some important aspects of

learning: hearing, saying, and writing down. Little kids need crayons, pencils, and paper to play with the ideas in these programs.

Printing numbers and letters gives them small muscle coordination that helps when they go to school and learn what to do with a pencil. Sesame Street and you can help the kids

hear and say their numbers and letters.

Second, make sure the kids don't think the computer is magic. Let them know it's just a machine.

Third, small children are often smeared from head to toe with peanut butter and jelly, so wash them off before you let them near the computer. Don't tell them I said that.

Before you open the Early Childhood Learning Surprise Packet, I want you to know that I'm willing to help anyone who has trouble keying in Fun House programs. My address is: Richard Ramella, 1493 Mountain View Ave., Chico, CA 95926. A self-addressed, stamped envelope gets you a quick answer.

```

100 REM * TYPE * TRS-80 LEVEL II AND COLOR BASIC 4K
110 REM * FUN HOUSE / SEPT. '83 /R. RAMELLA
120 CLS
130 DATA DOG,CAT,MOM,DAD,STOP,GO,BED,RED,BIG,SMALL,DOOR,APPLE
140 DATA HI,MY,I,ME,YOU,WE,PULL,PUSH,OPEN,CLOSE,HOP,MOP,FLOOR
150 DATA CAR,BIKE,RUN,APPLE,STAR,MOON,DAY,SLEEP,PEEP,EYE,NOSE
160 DATA FOOT,BAND,BOY,GIRL,HELLO,EGG,BREAD,SOUP,WATER,HIGH
170 DATA LOW,BIRD,QUICK,BROWN,FOX,OVER,LAZY,THE
180 CLEAR 500
190 DIM A$(54)
200 FOR A=1 TO 54
210 READ A$(A)
220 NEXT A
230 CLS
240 CS=""
250 BS=A$(RND(54))
260 PRINT BS
270 CS=CS+INKEY$
280 IF RIGHTS$(CS,1)=CHR$(32) THEN CS="" : PRINT @ 192,"      ";
290 PRINT @ 192,CS;
300 IF CS<>BS THEN 270
310 FOR T=1 TO 6
320 PRINT @ 256,"GOOD"
330 FOR G=1 TO 50
340 NEXT G
350 PRINT @ 256,"      ";
360 FOR G=1 TO 50
370 NEXT G
380 NEXT T
390 GOTO 230
400 END

```

Type

Number Tap—Level II

```

100 REM * NUMBER TAP * TRS-80 LEVEL II
110 REM * FUN HOUSE / SEPT. '83 /R.RAMELLA
120 CLS
130 ES(1)="(0)+"+STRINGS(6," ")+"(0)"
140 ES(2)="-X-"+STRINGS(6," ")+"-X-"
150 SS=CHR$(191)+CHR$(191)
160 C=0
170 N=0
180 Z=224
190 A=RND(9)
200 PRINT @ 160,A;
210 AS=INKEY$
220 IF AS="" THEN N=N+1
230 IP AS=CHR$(32) GOSUB 040
240 IF C=9 THEN N=200
250 IF N=200 THEN 270
260 GOTO 210
270 IF C>>A THEN 630
280 PRINT @ 0,"YES";
290 Y=3
300 FOR X=0 TO 40
310 SET(X,Y)
320 SET(X,Y+20)
330 NEXT X
340 X=0

```

Listing continued



**HEAR PAC-MAN!
WRITE MUSIC! ETC.**

\$19.95

**FOR YOUR MODEL I, III OR 4
ECONOMICAL!**

Our kit enables the amplifier and speaker in your CTR-41, CTR-80, or CCR-81 recorder to provide sound generated by your TRS-80*. Nothing else to buy. Does not eliminate any other function. (Modified CTR-80 will not accept batteries.)

ANYONE CAN INSTALL IT!

No trace-cutting. Detailed instructions permit easy installation within one hour. CTR-80 kit requires only a screwdriver to assemble. CTR-41 and CCR-81 kits require drilling one hole. Some CTR-41's may require removal of excess solder at one mounting point.

NO CLUTTER!

Installed components are enclosed within and are integral with the recorder case.

ONLY \$19.95 POSTPAID!

Virginia residents add 4% sales tax. Be sure to specify recorder model CTR-41, CTR-80, or CCR-81 and send check or money order to.

THE LOWERRE COMPANY, INC.
P. O. Box 2183
Manassas, Virginia 22110

*TRS-80 is a trademark of Tandy Corp.

v 477

Listing continued

```

358 FOR Y=3 TO 23
368 SET(X,Y)
370 SET(X+48,Y)
388 NEXT Y
390 PRINT @ 196,E$(1);
400 PRINT @ 264,CHR$(186)+$S+CHR$(181);
410 Z=20
428 X=38
430 FOR Y=15 TO 20
440 SET(X,Y)
458 SET(X-Z,Y)
460 Z=Z-2
470 X=X-1
488 NEXT Y
490 Y=Y-1
508 FOR X=16 TO 25
510 SET(X,Y)
528 NEXT X
538 FOR T=1 TO 15
548 FOR K=1 TO 2
558 PRINT @ 196,E$(X);
568 FOR L=1 TO 28
570 NEXT L
588 NEXT K
590 NEXT T
608 FOR T=1 TO 100
610 NEXT T
628 GOTO 120
630 PRINT @ 18,"NO";
640 FOR T=1 TO 500
650 NEXT T
660 FOR B=253 TO 224 STEP -1
670 PRINT @ B," ";
680 FOR T=1 TO 18
690 NEXT T
700 NEXT B
710 FOR T=1 TO 588
720 NEXT T
730 H=1
740 FOR B=224 TO 224+(A*3)-3 STEP 3
750 PRINT @ B,$S
760 PRINT @ B+120,H
770 H=H+1
780 FOR T=1 TO 180
790 NEXT T
800 NEXT B
810 FOR T=1 TO 500
820 NEXT T
830 GOTO 120
840 PRINT @ Z,$S
850 C=C+1
860 Z=Z+3
870 RETURN
880 END

```

Repeat

This short program is for Level II and Color Basic. Type RUN and tap the enter key. Then let the little one take over. Any key tapped endlessly repeats a character on the screen. When the child taps another key, it starts repeating.

This is fun for very small children. It shows that something happens on the screen when you tap keys.

Letter Find

This listing works in Color Basic and Level II. The program prints the entire alphabet except for one letter that it leaves blank. The player figures out which letter is missing and taps that letter on the keyboard.

The program indicates whether the choice is right or wrong and prints the mystery letter. It repeats endlessly. This exercise helps the youngster learn the alphabet and the keyboard.

ABC

Again, this listing supports

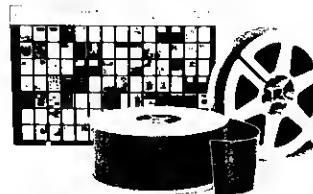
TRS-80 COMPUTER DISCOUNTS

- Factory Direct
- Best Prices Anywhere
- No Out-of-State Taxes
- 100% Radio Shack Warranty
- Free Price List

SCOTT TASSO ASSOCIATES

175 E North Delsea Drive
Vineland, N.J. 08360
800-257-0426
NJ 609-691-7100

this publication
is available in
microform



University Microfilms International

300 North Zeeb Road Dept. P.R. Ann Arbor, MI 48106 U.S.A.	18 Bedford Row Dept. P.R. London, WC1R 4EJ England
--	---

Level II and Color Basic. The player starts with a score of 100, but the screen is blank. The object is to type in the alphabet in order from A to Z.

Nothing happens if the player types a letter out of order. If he makes three wrong choices in a row, the right letter briefly appears on the screen. The game ends when the player correctly types the entire alphabet.

Type

Level II and Color Basic are in the same listing. In lines 130-170, I have written 54 words that are useful to know. The program shows the word, then the player tries to type that word. If he makes a mistake, the player taps the space bar, the mistake disappears, and he starts typing over from the beginning of the word.

You can put other words in data lines 130-170, but you must replace these words on a one-to-one basis so you always have 54 words. If you change

```

100 REM * NUMBER TAP * TRS-80 COLOR BASIC 4K
110 REM * FUN BOUZE / SEPT. '83 / R.RAMELLA
120 CLS(0)
130 C=0
140 N=0
150 Z=224
160 A=RND(9)
170 PRINT @ 160,A;
180 AS=INKEY$()
190 IF AS="" THEN N=N+1
200 IF AS=CHR$(32) GOSUB 560
210 IF C=9 THEN N=200
220 IF N=200 THEN 240
230 GOTO 100
240 IF C<>A THEN 330
250 PRINT @ 96,"YES";
260 FOR R=1 TO 5
270 SOUND 204,2
280 SOUND 193,1
290 SOUND 105,2
300 SOUND 176,2
310 NEXT
320 GOTO 120
330 PRINT @ 96,"NO";
340 FOR R=1 TO 2
350 SOUND 193,3
360 SOUND 176,3
370 SOUND 170,3
380 SOUND 159,5
390 NEXT N
400 FOR B=253 TO 224 STEP -1
410 PRINT @ B,CRR$(120);
420 SOUND B-20,1
430 NEXT B
440 FOR T=1 TO 500
450 NEXT T
460 FOR B=224 TO 224+(A*3)-3 STEP 3
470 BS=CRR$(143+RND(7)*16)
480 PRINT @ B,B$+BS;
490 SOUND B-50,5
500 FOR T=1 TO 50
510 NEXT T
520 NEXT B
530 FOR T=1 TO 750
540 NEXT T
550 GOTO 120
560 SOUND RND(5)*13+150,1
570 C=C+1
580 X$=CHR$(143+RND(7)*16)
590 PRINT @ Z,X$+X$;
600 Z=Z+3
610 RETURN
620 END

```

Number Tap—Color Basic



**Verbatim®
Diskettes**

Top-quality Verbatim® Diskettes from **Tech•Data**, your complete supply and peripheral wholesaler. **Dealers only.**

Call Toll Free
1-800-237-8931.
In Florida, call
813-577-2794.

T Tech•Data Corporation
3251 Tech Drive North
St. Petersburg, FL 33702

**TRS-DOS → CP/M
with
REFORMATTER™**

Model II users! Convert files between TRSDOS and CP/M!

- **REFORMATTER** runs under TRSDOS
- Operates on single drive system
- Converts in both directions
- CP/M operating system not needed
- All TRSDOS record lengths supported
- Initializes blank CP/M diskette
- Displays or dumps CP/M files
- Manipulates CP/M directory under TRSDOS

\$249.00 from stock. CP/M ↔ IBM, TRSDOS ↔ DEC, and CP/M ↔ DEC versions of **REFORMATTER** also available at \$249.00 from MicroTech Exports, Inc., 467 Hamilton Ave., Palo Alto, CA 94301

□ Tel: 415/324-9114 □ TWX: 910-370-7457 MUH-ALTOS

TM TRS80 color

From the January 1981 issue of the CSRA Computer Club newsletter:

There was some amusement at the November meeting when the Radio Shack representatives stated that the software in the ROM cartridges could not be copied. This month's 68 Micro Journal reported they had disassembled the programs on ROM by covering some of the connector pins with tape. They promise details next month. Never tell a hobbyist something can't be done! This magazine seems to be the only source so far of technical information on the TRS-80 color computer. Devoted to SS-50 6800 and 6809 machines up to now, 68 Micro Journal plans to include the TRS-80 6809 unit in future issues.

To get the MOST from your 6809 CPU - This is the BEST SOURCE! The ONLY Magazine for the 6809 Computer Months Ahead of All Others!

68 MICRO JOURNAL
5900 Cassandra Smith Rd.
Hixson, TN 37343
USA
1 Yr.—\$24.50 2 Yrs.—\$42.50 3 Yrs.—\$64.50
Foreign Surface Add \$12.50 to USA Price
Foreign Air Mail Add \$35.00 to USA Price
Canada & Mexico Add \$5.50 Yr. to USA Price

✓ 213

the number of words, count the total words in lines 130-170. Replace the number 54 with your new total in lines 190, 200,

and 250.

If you put in hundreds and hundreds of words, you must change line 180 CLEAR 500 to

a higher number, perhaps CLEAR 1000. Above all, remember that you can't use the left-arrow key to erase.

```

100 REM * HOW MANY? * TRS-80 LEVEL II
110 REM * FUN HOUSE / SEPT. '83 / R.RAMELLA
120 CLS
130 CLEAR 500
140 FOR A=1 TO 32
150 D$=D$+"YES "
160 E$=E$+"NO "
170 HEXT A
180 A=RND(5)
190 B=RND(5)
200 IF A+B=10 THEN 180
210 AS=CHR$(191)
220 PRINT @ 13,A"+B"= ";
230 FOR C=70 TO 78+128*(A-1) STEP 128
240 PRINT @ C,AS
250 NEXT
260 FOR C=82 TO 82+128*(B-1) STEP 128
270 PRINT @ C,A$;
280 NEXT
290 PRINT @ 21,"";
300 CS=IHKEYS
310 IF CS<>" " AND VAL(C$)>0 AND VAL(C$)<10 THEN PRINT @ 22,CS; ELSE
300
320 C=VAL(C$)
330 IF C=A+B THEN X$=D$: GOSUB 370 ELSE X$=E$: GOSUB 370
340 FOR T=1 TO 2000
350 NEXT
360 GOTO 120
370 FOR F=704 TO 832 STEP 64
380 PRINT @ F,X$;
390 NEXT F
400 IF C<>A+B GOSUB 420
410 RETURN
420 FOR G=1 TO 10
430 PRINT @ 21,A+B;
440 FOR T=1 TO 20
450 NEXT T
460 PRINT @ 22," ";
470 FOR T=1 TO 15
480 HEXT T
490 NEXT G
500 PRINT @ 21,A+B;
510 RETURN
520 END

```

How Many?—Level II

Number Tap

This program has separate Level II and Color Basic listings. In both versions, a number from one to nine appears on the screen. The player taps the space bar as many times as the number indicates. If a three appears, the player taps the space bar three times.

Each tap produces a new rectangle of light on the screen. The player must act quickly because if nothing happens within five or six seconds, the computer assumes a wrong answer.

In Level II Number Tap, if the answer is right, the word "YES" appears along with a smiling face. If the answer is wrong, a "NO" appears and the computer counts out the right answer.

In Color Number Tap, a right answer gets a happy song, and a wrong answer gets a sad

NEW MOD I/III SOFTWARE

32K, Cassette or 1 Disk (printer optional)

ACAP: machine code — electronic circuit analysis. 20 nodes, 60 components. Disk I/O, component editing, tolerances, Monte-Carlo, worst case, log or linear, noise equivalent bandwidth, spectral data. \$39.95

REAP: Level II BASIC — menu driven real estate analysis package. Compare investment alternatives taking tax and depreciation into account. Individual tax, comparative investment, property, exchange basis, and installment sales analysis. \$39.95

QSORT: machine code — menu driven coupon management program. High speed sort finds coupons fast — warns of coupons about to expire. Unlimited categories. \$39.95

SIM2: Level II BASIC — Blackjack simulation. Check your favorite strategies and card counting schemes. Special report option lists every action taken. Generate performance statistics. \$39.95

PAID: Level II BASIC — compound interest, annuities, loan payments, present worth, future worth, and rate of return calculations all in one package. \$39.95

BV ENGINEERING
P.O. BOX 3351, RIVERSIDE, CA 92519
(714) 781-0252

v74

ALLOWS UNLIMITED COPIES OF MOST RADIO SHACK PROGRAMS INCLUDING SCRIPSPIT AND VISICALC

Comes on a disk

No Programming Experience Necessary

ONLY
\$15.00

TOLL FREE 800-855-0071

In
Kansas
316
665-3611

v142



526 E. 4th

HUTCHINSON, KANSAS 67501

BACKUP

two/sixteen
magazine

The journal for business, professional, and amateur programmers of the TRS-80 Model II & 16.

THE ONLY MAGAZINE FOR MODEL II & 16 USERS

two/sixteen magazine
131A East Orange St.
Lancaster, Pa. 17603
(717) 397-3364

NEW

NEW

the "Phoenix"

The New Personal Computer by Progressive Electronics
• TRS-80 Mod-III & CP/M® Compatible

Plus:

- 128k Ram
- 80 x 24 Video
- 512x240 Graphics
- Alpha-Graphics
- Parallel Printer
- Light Pen
- Audio



5 mhz Z-80 • CPU
Double Den. Disks
RS-232
Upper/Lower Case
Typewriter Keyboard
6 Expansion Slots
5 Ram Sockets

Available NOW! as a Kit: Less Rom & Ram

Includes:

- ... 6 Slot - Cpu Board with Video, Graphics,
Printer, Light pen, & Audio Interfaces
- ... Disk Controller Card
- ... 128k Ram Card
- ... Keyboard, Enclosure, Power Supply, Boot Rom;
Parts Kit and Assembly Manual

\$ 599.00

Disk Drives for Models 3 and 4

A Complete "Top Quality" Kit with Double Density "REMEX" Drive,

Premium Quality Drive Controller

Power Supply, Cables & Hardware

Second Drive \$ 179.00 -- Double Sided \$ 248.00

\$ 379.00

DOUBLER: (Model-I)	\$ 99
CHARACTER GENERATOR:	\$ 18
MDX-2 EXPANSION INTERFACE	\$ 469
BOARD & MANUAL :	\$ 74
PARTS KIT :	\$ 189
"ZIPPY" Mod-3 SPEED UP	\$ 69

Bare BOARDS & MANUALS for the
"Phoenix"

• CPU	• \$ 99	• RAM	• \$ 49
• DISK-3	• \$ 49	• RS-232	• \$ 49
• DISK-1	• \$ 59	• P/S	• \$ 15

PROGRESSIVE

ELECTRONICS

537 East Main St.
Lancaster, Ohio 43130

v143

Phone 614-687-1019
9-5 Weekdays
Sat. 9-Noon
Visa-M.C.

*TRS-80 is a trademark of Tandy

*CP/M is a trademark of Digital Research

...Add Shipping & Handling...

song. The right answer always appears.

How Many?

This program presents endless addition problems with answers less than or equal to nine. It plays an adding game that lets the player add up the answer in a way that teaches both counting and addition.

Say the problem is $2 + 3 = ?$. Beneath the 2 are two light blocks; beneath the 3 are three blocks of light. The player taps an answer between one and nine.

The separate Level II and Color Basic versions are slightly different. In Level II How Many?, a wrong answer gets a few rows of "NO" and a right answer gets rows of the word "YES." If the answer is wrong, the right answer flashes over the wrong answer.

In Color How Many?, a sad song signals no, and a happy song signals yes. The program corrects wrong answers.

Next month I'll have some activities that will help people

already in school. Don't play hooky because you think Fun

House will be like eight hours of math drill. It won't! ■

```
100 REM * HOW MANY? * TRS-80 COLOR BASIC 4K
110 REM * FUN HOUSE / SEPT. '83 / R.RAMELLA
120 CLS(0)
130 A=RND(5)
140 B=RND(5)
150 IF A+B=10 THEN 130
160 A$=CHR$(143+RND(7)*16)
170 B$=CHR$(143+RND(7)*16)
180 IF B$=A$ THEN 170
190 PRINT @ 9,A"+B"= ";
200 FOR C=74 TO 74+(64*(A-1)) STEP 64
210 PRINT @ C,A$;
220 NEXT
230 FOR C=70 TO 70+(64*(B-1)) STEP 64
240 PRINT @ C,B$;
250 NEXT
260 PRINT @ 17,"";
270 CS=INKEY$
280 IF CS<>" " AND VAL(C$)>0 AND VAL(C$)<10 THEN PRINT @ 16,C$" "
; ELSE 270
290 C=VAL(C$)
300 IF C=A+B GOSUB 340 ELSE GOSUB 410
310 FOR T=1 TO 1500
320 NEXT
330 GOTO 120
340 FOR F=1 TO 3
350 SOUND 204,2
360 SOUND 193,2
370 SOUND 176,2
380 NEXT
390 SOUND 210,6
400 RETURN
410 FOR F=1 TO 2
420 SOUND 147,4
430 SOUND 117,4
440 SOUND 09,5
450 NEXT
460 FOR F=1 TO 10
470 PRINT @ 17,A+B;
480 SOUND RND(10)*20,1
490 PRINT @ 18,CHR$(143+RND(7)*16);
500 FOR T=1 TO 20
510 NEXT T
520 NEXT F
530 PRINT @ 17,A+B;
540 RETURN
550 END
```

How Many?—Color Basic

wabash®
six-year warrantied ✓367
DISKETTES!
\$18.95/box (10)
with FREE library case!

5 1/4" single-side, single-density, double-density add \$2/box. 8" disks comparably priced. Add \$2 per order shipping. In Illinois add 6% sales tax. Immediate shipment on VISA, Master Card or Money Order. Add 14 days for personal checks.

CALL TOLL FREE (800) 222-1248
In Illinois Call (312) 882-8315
Cell for our volume discount price!

DIGITAL IMAGES
Box 941005, Schaumburg IL 60194

MODEL 100 SOFTWARE

Take it with you when you go!

CRIBBAGE \$22.95

Take a break in your journey for a relaxing hand with your micro. The Cat's Paw® Cribbage challenger is a worthy opponent for 1 player, or an electronic scorekeeper for 2. 24K required.

EXPENSE REGISTER \$24.95

Keep track of expenses while you travel. Supports 15 different accts. Save to RAM file or Cassette. Printouts by date or acct. code. Stores records of 300 transactions with 32K.

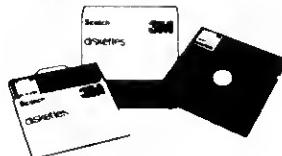
Model III/IV Disk available. BOTH only \$40.

Please add \$2. ship./hndg. per order.

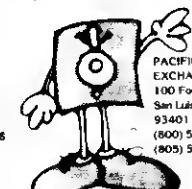
L/R SOFTWARE
P.O. Box 39
Garfield, AR 72732
(501) 443-2257 ✓268

Scotch® Diskettes

Rely on Scotch® diskettes to keep your valuable data safe. Dependable Scotch diskettes are tested and guaranteed error-free. The low abrasivity saves your read/write heads. They're compatible with most diskette drives.



(800)235-4137



PACIFIC EXCHANGES
100 Foothill Blvd.
San Luis Obispo, CA
93401 In Cal call
(800) 592-5935 or
(805) 543-1037

Dealer Inquiries Invited

✓ 207

Fame and Fortune may be yours by entering:

80 Micro's Young Programmer's Contest 1983-1984

Grand Prize \$300, Plus Publication

3 1st prizes—\$200 each, Plus Publication

3 2nd prizes—\$100 each, Plus Publication

3 3rd prizes—\$50 each, Plus Publication

Honorable Mentions—Free subscription to

80 Micro and possible publication

(These prizes are in addition to our regular purchase price.)

If you are an aspiring Programmer, 18 years or younger, enter **80 Micro's** 2nd Annual Young Programmer's Contest. Your entry may be for any TRS-80. Programs will be judged on originality, documentation (more on this below), and program elegance. The age categories are 11 and under, 12 through 14, and 15 through 18. All entries will be judged by the **80 Micro** staff.

Rules

1. Final entries must be in by November 1, 1983.
2. All entries must be submitted in a 10×13" envelope and must include: typewritten, double-spaced documentation; a printed copy of the program listing; a magnetic disk or cassette containing the program listing, the documentation, and any figures or tables; and a completed entry blank.
3. Documentation should consist of an explanation of the program, its purpose, how to use it, and the necessary software and hardware needed to use it (including memory re-

quirements). Good documentation also points out the interesting algorithms and program techniques used without giving a line-by-line account.

4. Entries must be original and unpublished.

5. All winning programs become the property of **80 Micro**.

6. The category in which you will be judged will be determined by your age as of November 1, 1983. You must not have turned 19 by that date.

7. You may submit as many entries as you like, however, each one must be submitted separately and must have all of the information and materials stated above.

The 80 Micro Young Programmer's Contest

Name _____ Age _____ Date of Birth _____

Street Address _____ City _____

State/Zip _____ Phone _____

Machine (circle one)

Model I

Model III

Model 4

Model II/12/16

Model 100

Color Computer

Pocket Computer

Other _____

Include this form with your entry and return to:

Young Programmer's Contest

80 Micro

80 Pine Street

Peterborough, NH 03458

*A trademark of Radio Shack, a division of Tandy Corporation.

TAKE II



This column features Model II, 12, and 16 conversions of earlier programs. Readers who have converted programs for their own use are encouraged to submit them.

"Mail List" first appeared in *80 Programs for the TRS-80 1001001 Inc., Peterborough NH, 1979, pp. 54-56*. This Model II conversion was done by Byron Lott of 913 Inverness Way, Sunnyvale, CA 94087.

"Mail List" offers 12 program options including search; list by name, city, state; and so on. The program lets you add and save data, or make changes to existing data. Your list, once compiled, either appears on the screen or is sent to the printer. You take care of only the postage. ■

INVESTMENT SOFTWARE For Technical Analysis of Stocks and Commodities

Trend Analysis Program (TA2) \$45.00
New version of this popular program. Calculates moving averages & deviation from trend. Makes graphs w/your printer.

Advance-Decline Program (AD) \$37.50
Calculates Adv-Dec line, up-down volume & short term trading index (TRIN) for input to TA2 Program. For breadth-of-market analyses.

Each program comes with User's Guide & several yrs of daily NYSE data. Other software also available. Free brochure.

For TRS-80 Model I or III with 48K, 2 disk drives & printer.

Harley D. Wilbur ✓369
9709 Elrod Road
Kenington, Maryland 20895

MODEL I CP/M 2.2

Upgrade your Model I with a BIGMEM kit and enjoy all these features:

- Run 64K CP/M or your Model I DDS
- 48K internal memory on power-up
- plus access to 32K E/I memory
- 2.7K protected RAM above ROM
- Overlay ROM with your RAM BASIC

BIGMEM kit includes 64K RAM chips, A&T controller, cable, solder and instructions. MEM LOW PRICE \$169*. Disk software: 64K CP/M 2.2 (\$119), Utilities (\$20), Expand AIDS3 Mem (\$20), 55K VisiCalc Storage (\$34). Free USA shipping.



MICROHATCH



PO Box 501

DeWitt, NY 13214 ✓419

(315)446-8031 after 6PM

VISICOM TO VISICOP, BIBRA TO MICROHATCH,
CP/M TO DIGITAL RESOURCES INC.

Program Listing

```

1 REM 14-APR-82 *BDL*
5 CLS
8 PRINTTAB(22) "RUNNING PROGRAM -MAIL/BAS-":PRINT:PRINT
9 FOR T=1 TO 500:NEXT T
10 CLEAR12000:CLS:DIM N1$(101),N2$(101),A$(101),C1$(101),C2$(101),C3$(101),PH$(1
01),OS$(101),BS$(101)
15 NFS="POSTMAN":ONERRORGOTO2410
20 QS=""::ZLS=""::Z2$=""::QPS=""::PRINT@188,"MAILING LIST MENU"
25 PRINT:PRINT
30 PRINT"1 CREATE NEW LIST"
30 PRINT"2 SEARCH FOR ONE NAME"
30 PRINT"3 LIST ALL NAMES IN ONE CITY"
30 PRINT"4 LIST ALL NAMES WITH THE SAME OPTION LINE"
30 PRINT"5 LIST ALL NAMES WITH THE SAME CITY AND OPTION"
30 PRINT"6 LIST ALL NAMES WITH THE SAME ZIP CODE"
30 PRINT"7 LIST ALL NAMES IN LIST"
100 PRINT"8 ADD NEW NAMES TO THE LIST"
110 PRINT"9 MAKE CORRECTIONS TO LIST"
120 PRINT"10 SAVE CURRENT FILE ON DISK"
130 PRINT"11 INPUT A FILE FROM DISK"
140 PRINT"12 PRINT TOTAL NUMBER OF NAMES IN LIST"
142 PRINT"13 SORT CURRENT FILE"
144 PRINT"14 LIST DISK-FILES"
145 PRINT"15 EXIT PROGRAM"
150 PRINT:INPUT"ENTER SELECTION";A:CLS:ON A GOTO 160,280,455,650,800,970,1130,13
30,1470,1690,1760,1830,2050,2400,1985
160 PRINT"NOTE: ENTER '*' FOR 'LAST NAME' AFTER FINAL DATA ENTRY TO INDICATE -E
OF-"
165 PRINT
170 FOR R=1 TO 100
180 PRINT" ";R
190 INPUT"ENTER LAST NAME";N1$(R)
200 IF N1$(R)="" THEN CLS:GOTO 20
205 PRINT
210 INPUT"ENTER FIRST NAME AND MIDDLE INITIAL";N2$(R)
215 PRINT
220 INPUT"ENTER STREET ADDRESS";A$(R)
225 PRINT
230 INPUT"ENTER CITY, STATE, ZIP CODE (C...C, SS, ZZZZZ)";C1$(R),C2$(R),C3$(R)
235 PRINT
240 INPUT"ENTER PHONE NUMBER";PH$(R)
245 PRINT
250 INPUT"ENTER OPTION CODE";QS(R)
260 NEXT R
280 PRINT"ENTER NAME TO BE SEARCHED"
285 PRINT
290 PRINTTAB(5)"LAST NAME";
300 INPUT N1$
305 PRINT
310 PRINTTAB(5)"FIRST NAME";
320 INPUT N2$
330 PRINT
335 INPUT"RESULTS ON VIDEO OR PRINTER (V OR P)";QS:PRINT:PRINT
340 FOR R=1 TO 100:IF (N1$=N1$(R))AND(LEFT$(N2$,4)=LEFT$(N2$(R),4)) THEN 375
350 NEXTR
360 CLS:PRINT"NAME REQUESTED NOT FOUND IN LIST"
370 GOTO20
375 IFQS="P"THEN GOSUB1920:GOSUB1925:GOTO440
380 PRINTN2$(R);";";N1$(R)
390 PRINTA$(R):PRINTC1$(R);";";C2$(R);";";C3$(R)
395 PRINT
400 INPUT"DO YOU WANT THE PHONE NUMBER (Y OR N)";Z1$
410 IFZ1$="Y"THEN PRINTPH$(R)
415 PRINT
420 INPUT"DO YOU WANT THE OPTION CODE";Z2$
430 IFZ2$="Y"THEN PRINTQS(R)
435 PRINT
440 INPUT"DEPRESS <ENTER> TO RETURN TO MENU";Z3$
450 CLS:GOTO20
455 INPUT"What IS THE CITY NAME";C1$:PRINT
460 C=8:INPUT"DO YOU WANT THE LIST WITH OPTION CODE(Y OR N)";Z1$
465 PRINT
470 INPUT"DO YOU WANT THE LIST ON VIDEO OR PRINTER (V OR P)";QS:IFQS="P"THEN472E

```

Listing continued

Listing continued

```

LSEGOTO475
472 PRINT:INPUT"PRINT INDIVIDUALLY OR COMPLETE LIST (I OR C)":QPS
473 GOSUB1920:GOT0500
475 PRINT
490 PORT=1TO5:PRINT:NEXTT
500 FORR=1TO100
510 IFC1$=C1$(R)THEN540
520 IFN1$(R)=""THEN615
530 GOT0610
540 IPQS="P"THENIFQPS="C"THENGOSUB1925:GOT0610ELSEPRINT:GOSUB1925:PRINT:INPUT"W
HEN READY TO PRINT DEPRESS <ENTER>":Q$:GOT0610
545 PRINT
550 PRINTN2$(R);";";N1$(R)
560 PRINTAS$(R)
570 PRINTC1$(R);";";C2$(R);";";C3$(R)
580 IFZ1$="Y"THENPRINTOS$(R)
590 PRINT
600 PRINT:PRINT
605 C=C+1:IFC=3THENC=0:INPUTZZ$
610 NEXTR
615 PORT=1TO5:PRINT:NEXTT
630 INPUT"DEPRESS <ENTER> TO RETURN TO MENU":Z3$
640 CLS:GOT020
650 INPUT"What IS THE KEYWORD(OPTION CODE)":K$
655 PRINT
660 C=0:INPUT"Do YOU WANT THE LIST ON VIDEO OR PRINTER (V OR P)":Q$:IFQ$="P"THEN
662 ELSEGOTO665
665 PRINT:PRINT INDIVIDUALLY OR COMPLETE LIST (I OR C)":QPS
668 GOSUB1920:GOT0670
670 PORT=1TO5:PRINT:NEXTT
672 FORR=1TO100
688 IFQS(R)=K$THEN710
690 IFN1$(R)=""THEN765
700 GOT0760
710 IPQS="P"THENIFQPS="C"THENGOSUB1925:GOT0760ELSEPRINT:GOSUB1925:PRINT:INPUT"W
HEN READY TO PRINT DEPRESS <ENTER>":Q$:GOT0760
715 PRINT
728 PRINTN2$(R);";";N1$(R)
730 PRINTAS$(R)
740 PRINTC1$(R);";";C2$(R);";";C3$(R)
750 PRINT:PRINT:PRINT
755 C=C+1:IFC=3THENC=0:INPUTZZ$
760 NEXTR
765 PORT=1TO5:PRINT:NEXTT
770 INPUT"DEPRESS <ENTER> TO RETURN TO MENU":Z3$
772 CLS:GOT020
780 C=0:INPUT"ENTER CITY NAME":C1$
785 PRINT
790 INPUT"ENTER KEYWORD(OPTION CODE)":K$
795 PRINT
800 INPUT"Do YOU WANT THE LIST ON VIDEO OR PRINTER (V OR P)":Q$:IPQS="P"THEN825E
LSEGOTO830
825 PRINT:PRINT INDIVIDUALLY OR COMPLETE LIST (I OR C)":QPS
827 GOSUB1920:GOT0840
830 PORT=1TO5:PRINT:NEXTT
840 FORR=1TO100
850 IFN1$(R)=""THEN940
860 IFK$=0$(R)THEN880
870 GOT0930
880 IPC1$<>C1$(R)THEN930
890 IPQS="P"THENIFQPS="C"THENGOSUB1925:GOT0930ELSEPRINT:GOSUB1925:PRINT:INPUT"W
HEN READY TO PRINT DEPRESS <ENTER>":Q$:GOT0930
895 PRINT
900 PRINTN2$(R);";";N1$(R)
910 PRINTAS$(R)
920 PRINTC1$(R);";";C2$(R);";";C3$(R)
925 PRINT:PRINT
928 C=C+1:IFC=3THENC=0:INPUTZZ$
930 NEXTR
940 PORT=1TO5:PRINT:NEXTT
950 INPUT"DEPRESS <ENTER> TO RETURN TO MENU":Z3$
960 CLS:GOT020
970 C=0:INPUT"ENTER THE ZIP CODE":C3$
975 PRINT
980 INPUT"Do YOU WANT THE LIST ON VIDEO OR PRINTER (V OR P)":Q$:IFQ$="P"THEN985E
LSEGOTO1000
985 PRINT:PRINT INDIVIDUALLY OR COMPLETE LIST (I OR C)":QPS
987 GOSUB1920:GOT01005
990 PRINT
1000 PORT=1TO5:PRINT:NEXTT
1005 FORR=1TO100
1010 IFC3$=C3$(R)THEN1040
1020 IFN1$(R)=""THEN1095
1030 GOT01090
1040 IPQS="P"THENIFQPS="C"THENGOSUB1925:GOT01090ELSEPRINT:GOSUB1925:PRINT:INPUT
"WHEN READY TO PRINT DEPRESS <ENTER>":Q$:GOT01090
1045 PRINT
1050 PRINTN2$(R);";";N1$(R)
1060 PRINTAS$(R)
1070 PRINTC1$(R);";";C2$(R);";";C3$(R)
1080 PRINT:PRINT:PRINT
1085 C=C+1:IFC=3THENC=0:INPUTZZ$
1090 NEXTR
1095 PORT=1TO5:PRINT:NEXTT
1110 INPUT"DEPRESS <ENTER> TO RETURN TO MENU":Z3$
1120 CLS:GOT020
1130 C=0:INPUT"WANT LIST WITH OPTION CODE(Y OR N)":Z1$
1135 PRINT
1140 INPUT"WANT LIST WITH PHONE NUMBER (Y OR N)":Z2$
1145 PRINT
1150 INPUT"Do YOU WANT THE LIST ON VIDEO OR PRINTER (V OR P)":Q$:IFQ$="P"THEN115
5ELSEGOTO1160
1155 PRINT:PRINT INDIVIDUALLY OR COMPLETE LIST (I OR C)":QPS

```

Listing continued

TYPITALL

The SCRIPSIT™ Compatible Word Processor

TYPITALL is a new word processing program which is upward compatible with SCRIPSIT™ for the Model 1 and 3 TRS-80. **TYPITALL** includes features like these: assign any sequence of keystrokes to a single control key. See the formatted text on the screen before printing. Send the formatted text to a disk file for later printing. Merge data from a file while printing. Send any control or graphic character to the printer. Use the same version on the Model 1 or 3. Reenter the program with all text intact if you accidentally exit without saving text. **TYPITALL (disk only)** \$129.95
Manual only (100 pages) \$25.00

SYSTEM DIAGNOSTIC

Complete diagnostic tests for every component of your TRS-80 Model 1 or 3. ROM: checksum test. RAM: three separate tests. Video Display: character generator, video RAM, video signal. Keyboard: every key contact tested. Line printer: character test. Cassette Recorder: read, write, verify. RS-232-C Interface: connector fault, transmission, framing, data loop, baud rate generator. Disk Drives: controller, read data, formatting, read/write/verify with/without erasing, disk drive timer, disk head cleaner. **System Diagnostic** \$99.95

TRS-80 MODEL III ASSEMBLY LANGUAGE

A complete course in assembly language, written for the beginner. Basic concepts, the Z-80 instruction set, complete Model III ROM and RAM information, programming examples; the disk controller, the TRSDOS 1.3 disk operating system, RS-232-C interface.

With the book you can also purchase **Monitor #5**, a comprehensive machine language monitor for the Model 1 or 3.

Book only \$16.95
Book and Monitor #5 on disk \$29.95

SMART TERMINAL

The intelligent terminal program, with automatic transmission and storage of data, true BREAK key, cassette and disk files compatible with SCRIPSIT™ and Electric Pencil™. Same program supports both cassette and disk systems.

Model 1 or 3 version \$74.95
Model 2/12 (CP/M) Version \$79.95

SMALL BUSINESS MANAGEMENT SYSTEM

• ORDER DESK: Enter orders, print invoices and mailing labels, recall invoices, automatically post sales to inventory.

• BOOKKEEPING: Complete ledgers of income and expenses by categories. Enter or change data, print ledgers or summaries.

• INVENTORY: Complete list of all products sold by type and selling price.

• CUSTOMIZATION: Complete installation package for each business.

TRS-80 Model 1/3 Version \$350.00

TRS-80 Model 2 Version \$400.00

Order desk & Inventory \$250.00

Bookkeeping only \$150.00

FREE Software Catalogue

Add \$3.00 postage & handling.
New York residents add sales tax.

Howe Software

14 Lexington Road
New City, NY 10566 ▶175

(914) 634 - 1821

Visa and MasterCard accepted.

*TRS-80 is a trademark of Tandy Corp.

What's After Basic?

If you ever wished that you had a better programming language, PASCAL 80 may be the language you dream about. It is a compiled language, faster, more accurate and easier to modify than Basic. Yet it is so easy to use that you can forget the hassles and diskette spinning of other compiled languages, including other versions of Pascal.

Now you can create your own command files that execute from DOS without having to load a language into the computer first, but do it with far less work than machine language. You can sell your compiled programs without any royalty payments!

Although designed for teaching and ideal for that purpose, PASCAL 80 also allows serious applications with a full fourteen digits of accuracy, even on log and trig functions!

PASCAL 80 allows you to create files on the TRS-80® Model I, Model III, LNW-80, PMC-80, or LOBO MAX-80 that will run on any of the other machines under TRS-DOS®, LDOS, NewDOS, NewDOS 80, DBL-DOS or DOS Plus.

SUMMER SPECIAL

FREE

Procedure Library

with

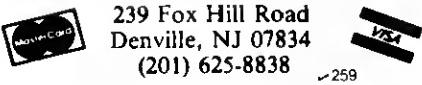
Orders postmarked by
August 30, 1983.

PASCAL 80 is used in dozens of High Schools, Colleges, and Technical Schools, and has been favorably reviewed in Byte, Creative Computing, and other magazines.

You get all of this at a bargain price of only \$99 plus \$2 shipping. If you call and order by MasterCard or VISA, we will even credit you \$1 for the phone call. Call or send your check today!

NEW CLASSICS SOFTWARE

239 Fox Hill Road
Denville, NJ 07834
(201) 625-8838



✓259

TRS-80® and TRS-DOS are trademarks of Radio Shack, LNW-80 of LNW Research, PMC-80 of Personal Micro Computers, LOBO, LDOS, and MAX-80 of Lobo Systems, DOS-Plus of Micro Systems Software, NewDOS and NewDOS 80 of Apparat, and DBL-DOS of Percom. PASCAL 80 is a trademark of New Classics Software.

NEW!! POINTER VARIABLES!

TAKE II

Listing continued

```

1157 GOSUB1920:GOTO1190
1160 FORT=IT05:PRINT:NEXTT
1190 FORR=ITC100
1200 IFN1$(R)=***"THEN1290
1210 IFQ$="P"THENIFQPS="C"THENGOSUB1925:GOTO1280ELSEPRINT:GOSUB1925:PRINT:INPUT
"WHEN READY TO PRINT DEPRESS <ENTER>;QS:GOTO1280
1220 PRINTH2$(R);";NI$(R)
1230 PRINTAS(R)
1240 PRINTC1S(R);";C2$(R);";C3$(R)
1250 IFZ1$="Y"THENPRINTOS(R)
1260 IFZ2$="Y"THENPRINTPH$(R)
1270 PRINT:PRINT
1275 C=C+1:IFC=3THENC=::INPUTZ2$
1280 NEXTR
1290 FORT=IT05:PRINT:NEXTT
1315 INPUT"DEPRESS <ENTER> TO RETURN TO MENU";Z3$
1320 CLS:GOTO20
1338 A=0:IFN1$(1)=***"THEN1465ELSEFORR=IT0100:IFN1$(E)=***"THEN1337
1335 A=A+1:NEXTE
1337 PRINT:PRINT"THESE ARE ";A;" NAMES IN THE CURRENT LIST"
1340 PRINT:PRINT:PRINT"NOTE: ENTER *** AFTER THE LAST DATA ENTRY TO INDICATE -E
OF-"
1350 PRINT
1360 FORR=(A+1)TO100
1370 PRINT:PRINT" ";R
1380 INPUT"ENTER LAST NAME";NI$(R)
1385 PRINT
1390 IFN1$(R)=***"THEN CLS:GOTO20
1400 INPUT"ENTER FIRST NAME AND MIDDLE INITIAL";N2$(R)
1405 PRINT
1410 INPUT"ENTER ADDRESS";A$(R)
1415 PRINT
1420 INPUT"ENTER CITY, STATE, ZIP CODE (C...C, SS, ZZZZZ)";C1$(R),C2$(R),C3$(R)
1425 PRINT
1430 INPUT"ENTER OPTION CODE";OS$(R)
1435 PRINT
1440 INPUT"ENTER PHONE NUMBER";PH$(R)
1450 NEXTR
1460 CLS:GOTO20
1465 CLS:PRINT"LIST NOT OPEN":GOTO20
1470 INPUT"ENTER LAST NAME";NI$
1475 PRINT
1480 INPUT"ENTER FIRST NAME AND MIDDLE INITIAL";N2$
1490 FORR=IT0100
1500 IFN1$(R)=***"THEN1530
1510 IF(N1$=NI$(R))AND(LEFT$(N2$,4)=LEFT$(NI$(R),4))THEN1555
1520 NEXTR
1530 CLS:PRINT"SORRY, NAME REQUESTED NOT FOUND IN LIST"
1540 PRINT
1550 GOTO20
1555 QS="";PRINT:PRINT"NOTE: IF NO CHANGE TO DATA, DEPRESS <ENTER> TO CONTINUE":
PRINT
1558 PRINT"CURRENT LAST NAME= ";NI$(R)
1560 INPUT"ENTER NEW LAST NAME";NI$(R)
1565 PRINT
1568 PRINT"CURRENT FIRST NAME AND MIDDLE INITIAL= ";N2$(R)
1570 INPUT"ENTER NEW FIRST NAME AND MIDDLE INITIAL";N2$(R)
1575 PRINT
1578 PRINT"CURRENT ADDRESS= ";A$(R)
1580 INPUT"ENTER NEW ADDRESS";A$(R)
1595 PRINT
1598 PRINT"CURRENT CITY, STATE, ZIP CODE =";C1$(R),";";C2$(R),";";C3$(R)
1600 INPUT"ENTER NEW CITY, STATE, ZIP CODE (C...C, SS, ZZZZZ)";C1$(R),C2$(R),C3$(R)
1615 PRINT
1618 PRINT"CURRENT OPTION CODE= ";OS$(R)
1620 INPUT"ENTER NEW OPTION CODE";OS$(R)
1635 PRINT
1638 PRINT"CURRENT PHONE NUMBER= ";PH$(R)
1640 INPUT"ENTER NEW PHONE NUMBER";PH$(R)
1655 PRINT
1668 PRINT"CORRECTION COMPLETE"
1670 PRINT
1675 PRINT:INPUT"DEPRESS <ENTER> TO RETURN TO MENU";Z3$
1680 CLS:GOTO20
1690 YY=R:INPUT"ENTER NAME OF FILE TO SAVE";NF$
1695 PRINT:PRINTTAB(2)*** WRITING LIST TO FILE ***
1710 OPEN"O",1,NFS
1715 PRINT#1,YY
1720 FORR=IT0YY
1730 PRINT#1,R,NI$(R),"N2$(R)","A$(R)","C1$(R)","C2$(R)","C3$(R)",OS$(R)",PH$(R)
1748 NEXTR
1745 CLOSE
1750 CLS:PRINT"LIST SAVED":GOTO20
1760 INPUT"ENTER NAME OF FILE TO LOAD";NF$
1775 OPEN "I",1,NFS
1780 PRINTTAB(3)*** LOADING LIST FROM FILE ***
1785 INPUT#1,YY
1790 FORR=IT0YY
1800 INPUT#1,R,NI$(R),N2$(R),A$(R),C1$(R),C2$(R),C3$(R),OS$(R),PH$(R)
1810 NEXTR
1815 NI$(YY+1)=***
1820 CLS:PRINT:PRINT"LOADING COMPLETE":CLOSE:GOTO20
1830 PRINT
1840 R=0:IFN1$(1)=***"THEN1890
1850 FORR=IT0100
1860 IFN1$(E)=***"THEN1890
1870 R=R+1
1880 NEXTE
1890 PRINT"THESE ARE ";R;" NAMES IN THE LIST"
1900 GOTO20
1920 CLS:INPUT"IF PRINTER READY DEPRESS <ENTER>";Q5$:PRINT:INPUT"TOP OF PAGE (Y
OR N)";Q5$
1922 IFQ5$="Y"THENSYSTEM"FORMS T"

```

Listing continued

Try **DISnDATA**.
The Disassembler That
Writes On Your TRS-80!
NEW!!! VERSION 2

- Outputs fully relocatable S-100 Assembly Language
- Version 2.0 - New Register editor, comments and help.
- Use of interrupt from cassette, disk and display memory level.
- Faster, faster fully integrated.

• Outputs " H37F7 DEFM 'Cass? ' DEFB 03H "

instead of the meaningless "equivalent".
" AB25 LD B,E
LD H,C
LD (HL),E
LD (HL),E
CCF
JR NZ,\$-5 ", etc

- Automatically identifies such data areas.
- Relocates itself to any desired RAM area, up/down one byte or as many as required
- Runs on TRS-80 Model I (Level II) or Model III, 16K or more, cassette or disk

To order **DISnDATA** phone (513) 435-4480 (M-F, 9 a.m. - 5 p.m. EST), or send check or money order for

#1354-12 (Model I/III cassette) \$34.95

#1354-22 (Model III diskette), TRSDOS* formal \$39.95

(U.S. Funds only) Add \$2.00 shipping (U.S.) \$5.00 (Foreign). \$3.00 Additional on C.O.D. Orders

Ohio Residents please add 6.5% Sales Tax

*Registered Trademark, Tandy Corporation
*Regis® Trademark, Apple Inc.

Professional Software for both Novice and Expert



Pro/Am Software
220 Cardigan Road
Centerville, Ohio 45459

Visa and Mastercard accepted
When ordering via card, include card number, interbank number, expiration date, your name, address and phone number

✓260

Let the
LETTER-WRITER
WORK for YOU

CREATE: forms, labels and form letters.

This machine code word processor can even ADD/SUBTRACT bookkeeping columns.

Change, delete, add, insert, move, copy (characters/lines/blocks) of text fast.

SELECT: margins, page length, number of copies, tabs, center lines / page, line spacing and LEGAL PAPER LINE NUMBERING.

MODEL I users get: Model III shift key controlled upper / lower case letters!!

EASIER to USE than other systems. Only 8 keys control 96% of the LW features!!

TRY a LW for 3 MONTHS. If not satisfied return it. We will refund all but \$3.50 to cover postage / handling. IF YOU CAN NOT RETURN IT, DO NOT BUY IT.

C. A. of N. Y. rates his LW purchase as "one of the best buys I have made. !"

TAPE 16K Model I/III systems \$23.99

DISK 32K Model I/III systems \$37.99

WE PAY: tax / US postage on ALL orders.

SPECIALS
Verbatim MD525 01 disks: 10 for \$25.95
Microsette C10 tape+box: 20 for \$13.95

Astro-Ster Enterprises 24 HOUR
5905 Stone Hill Dr. Computer Phone
Rocklin, CA 95677 (916) 624-3709

"Your Complete Computer Headquarters"

Friendly, Personal Service -

"West Texas Style"

"You don't talk to an order taker here!"

TRS-80 Computers



We Carry The Entire TRS-80 Line
Of Computers, Printers, Software
and Accessories.

Special While They Last:
Epson MX-80's at \$401*

For Your
BEST INVESTMENT
Value,
Call Us At
1-800-351-1580

Texas Residents Call Collect
915-283-2920

Similar savings on other merchandise. ✓169

Van Horn Office Supply

701 W. Broadway
P.O. Box 1060
Van Horn, Texas 79855

"Authorized Dealer Since 1976"

★ A MAGICAL INTRODUCTION TO COMPUTING. ★

COMPUTER CARNIVAL

has arrived, with 60 easy-to-use TRS-80 Level II BASIC programs for children of all ages. Characters like Sugar Louie and Madam Zelda will help your child expand his or her creativity and develop keyboard skills through games, puzzles, and educational quizzes.

COMPUTER CARNIVAL by Richard Ramella features:

- ★LARGE, READABLE TYPE
- ★SHORT, EASY-TO-TYPE PROGRAMS
- ★SPIRAL BINDING

To make the adventure even more enjoyable, take along **CARNIVAL COMPANION**, a ready-to-load cassette that lets your children spend more time playing and less time typing.



Photocopy of coupon is
acceptable for ordering.

★ A WAYNE GREEN PUBLICATION

✓ See List of Advertisers on Page 322

*TRS-80 is a trademark of the Radio Shack division of Tandy Corp.

UPS delivery if complete street address is provided.

339B8C

80 Micro, September 1983 • 335

COMPUTER CARNIVAL

(book only) BK7389 \$16.97 **COMPUTER CARNIVAL** and **CARNIVAL COMPANION** (book and cassette) CC7389 \$24.97. Add \$2.00 shipping and handling. Dealer inquiries invited

Call **TOLL-FREE 1-800-258-5473**
WAYNE GREEN BOOKS,
PETERBOROUGH, NH 03458

COMPUTER CARNIVAL and **CARNIVAL COMPANION** (book and cassette) CC7389 \$24.97

COMPUTER CARNIVAL (book only) BK7389 \$16.97

(include \$2.00 per order for shipping and handling charges) Payment Enclosed

MC VISA AMEX Card # _____

Expires _____ MC Bank# _____

Signature _____

Name _____

Address _____

City _____ and State _____

Zip _____

RIBBONS & SUPPLIES

SATISFACTION GUARANTEED
FREE SHIPPING in US and CANADA
NO MINIMUM ORDER
FREE CATALOG

DISCOUNTS apply to ANY COMBINATION of products. Deduct 10% for 6 to 23 items, 15% for 24 to 99, and 20% for 100 or more items. SCHOOLS may take an additional 5% discount.

MASTERCARD & VISA orders, send card number and expiration date. Checks accepted with no delay.

FREE SUPPLIES CATALOG includes instructions for loading refill loops. Most orders shipped within 24 hours. Florida residents add 5% sales tax.

REPLACEMENT FA8RIC	Ribbon in	Refill
RIBBONS FOR	Cartridge	Loop
Anadex 9500	13.00	3.95
Anadex Word Scribe	13.00	3.95
Axiom GP-80M	6.50	2.93
Axiom IMP I & II	13.50	2.93
Base 2	13.50	2.93
C-Itoh Prowriter	5.50	2.43
C-Itoh F-10	5.50	1.68
Diablo Hytype I	5.50	1.59
Diablo Hytype II	5.50	1.68
DEC LA34	5.50	2.03
Epson MX-70, MX-80	6.50	2.93
Epson MX-100	9.75	4.45
IBM PC (MX-80)	6.50	2.93
IBM PC (MX-100)	9.75	4.45
MPI 88G, 99G, 150	13.50	2.93
NEC 3500	T8A	2.43
NEC Spinwriter	5.50	2.43
NEC PC 8023A-01	5.50	2.43
Okiidata Microline 80, 82, 83 (spool)	2.50	
R.S. DW II (1449)	T8A	2.08
R.S. DMP 200 (1483)	T8A	2.93
R.S. DMP 400, (1418)	5.50	1.68
R.S. DMP 500 (1482)	T8A	2.93
R.S. DWP 410 (1449)	TBA	2.08
R.S. LP6, LP8 (1418)	5.50	1.68
R.S. LP3, LP4 (1414)	5.50	2.43

BASF DISKETTES, 5 1/4"

with hub ring, LIFETIME WARRANTY

STOCK#	SIZE/DEN	SECTORS	PRICE/80X
54974	SS/DD	SDFT	29.20
54976	SS/DD	10	29.20
54978	SS/DD	16	29.20
54980	DS/DD	SOFT	40.50
54982	DS/DD	10	40.50
54984	DS/DD	16	40.50
54986	SS/QUAD	SDFT	42.20
54988	SS/QUAD	10	42.20
54990	SS/QUAD	16	42.20
54992	DS/QUAD	SOFT	54.00
54994	DS/QUAD	10	54.00
54996	DS/QUAD	16	54.00

DATA SYSTEMS

(305) 788-2145 ^{✓99}

BOX 99 • FERN PARK, FL 32730

TAKE II

Listing continued

```

1924 PRINT:INPUT"WHEN READY TO PRINT DEPRESS <ENTER>";Q6$:RETURN
1925 LPRINTNFS;" ITEM NO."R
1930 LPRINTNZS(R),";";NL$(R)
1940 LPRINTAS(R)
1950 LPRINTCLS(R);";C2$(R);";C3$(R)
1960 IFZ15="Y"THENLPRINTOS(R)
1970 IFZ25="Y"THENLPRINTPHS(R)
1980 LPRINT" ";RETURN
1985 PRINTTAB(28)*** CAUTION ***
1987 PRINT:PRINT
1990 INPUT"CURRENT LIST SAVED IN DISK FILE (Y OR N)":Q9$ 
1995 IF Q9$="Y"THEN 2010
2000 IF Q9$="N"THEN CLS:PRINT"RETURNING TO MENU":PRINT:PRINT:GOTO20
2010 PRINT:PRINT:PRINT"PROCESSING COMPLETE":PRINT:END
2050 PRINT"SORTING CURRENT FILE"
2052 R=0:FORI=1TO100:IFN$(I)*** THEN2058
2054 R=R+1:NEXTE
2056 PRINT:PRINT"THESE ARE ",R," NAMES IN THE LIST"
2060 FORI=1TOR
2070 BS(I)=N1$(I)+" "+N2$(I)
2080 NEXTI
2090 D=1
2100 D=2*D
2110 IFD<=RTHEN2100
2120 D=INT((D-1)/2)
2130 IFD=0THEN2370
2140 FORI=1TOR-D
2150 FORJ=ITO1STEP-D
2160 L=J+D
2170 IFBS(J)<=BS(L)THEN2340
2180 X$=N1$(J)
2182 N1$(J)=N1$(L)
2184 N1$(L)=X$
2186 X$=N2$(J)
2188 N2$(J)=N2$(L)
2190 N2$(L)=X$
2200 X$=AS(J)
2202 AS(J)=AS(L)
2204 AS(L)=X$
2206 X$=C1$(J)
2208 C1$(J)=C1$(L)
2210 C1$(L)=X$
2212 X$=C2$(J)
2214 C2$(J)=C2$(L)
2216 C2$(L)=X$
2218 X$=C3$(J)
2220 C3$(J)=C3$(L)
2222 C3$(L)=X$
2224 X$=PHS(J)
2226 PH$(J)=PH$(L)
2228 PH$(L)=X$
2230 X$=OS(J)
2232 OS(J)=OS(L)
2234 OS(L)=X$
2300 X$=BS(J)
2310 BS(J)=BS(L)
2320 BS(L)=X$
2330 NEXTJ
2340 NEXTI
2350 GOTO2120
2370 CLS:PRINT"FILE SORT COMPLETE":GOTO20
2400 SYSTEM"DIR":INPUT"WHEN READY TO RETURN TO MENU, DEPRESS <ENTER>";Q$:CLS:GOT
O20
2410 IFERR=53THENCLS:PRINT"FILE REQUESTED NOT ON DISK":RESUME20
2415 IFERR=56THENCLS:PRINT"PRINTER NOT READY (ACTIVE/RIBBON)":RESUME20
2420 IFERR<>56THENCLS:PRINT"UNSPECIFIED ERROR":RESUME20

```



Reduction of an actual sign

NEW

FILEMATE II

A most versatile, easy-to-use, menu-driven manager for a truly random-access Relational Database System

TRS-80 Model I and III 48K, 2 Disk Drives

- Create your own file structure
- Instant access to any record
- Transfer data from one file to another
- Merge address list with a form letter
- Edit, Sort, Calculate, Print custom reports
- Revise file structure if needs change
- No need to re-enter the data
- Up to 2000 records on a 40 track diskette

DATAFILE SYSTEMS

801 Welch Rd., Suite 211

Palo Alto, CA 94304

(415) 326-1447

✓531

VISA or Mastercard

Diskette/Manual
\$75.00

Manual Only
\$10.00

Order The Banner Machine© — \$49.95 from

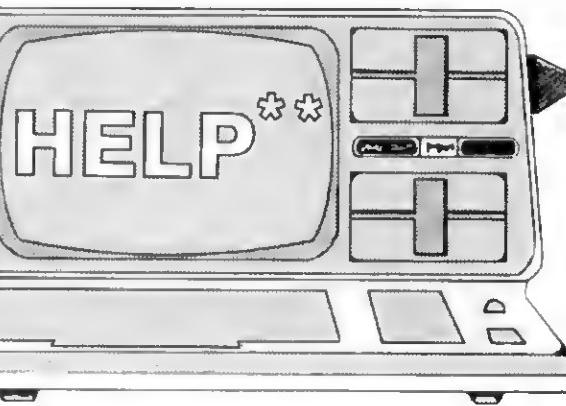
Virginia
Micro
Systems

Virginia Micro Systems
13646 Jeff Davis Highway
Woodbridge, Virginia 22191

Phone (703) 491-6502



YOUR TRS-80* NEEDS



*TRS-80 is a trademark of Radio Shack division of Tandy Corp.

**Read this ad and give us a call.
TOLL-FREE 800-258-5473.

It needs software before it can do anything. And good software is as valuable as any piece of hardware you can buy.

The Encyclopedia for the TRS-80 is a ten-volume reference series with over 200 programs for the Model I, Model III, and Color Computer. In each volume, you'll find:

- BUSINESS • GAMES • HARDWARE • TUTORIALS
- EDUCATION • GRAPHICS • INTERFACING • UTILITIES

Photographs, schematics, and program listings provide the essential detail you need for programming and tinkering.

**TOLL-FREE
1-800-258-5473**

SAVE TIME.

**TOLL-FREE
1-800-258-5473**

 With running the programs once you have them. **Encyclopedia Loader** provides direct loading of programs and saves you the time of typing and debugging.

These ten 30-minute cassettes have selected listings from each volume, ready for you to load and use.



Loaders and softcover Encyclopedias are available separately or in sets.

Don't Put Up The White Flag.

Get some help for yourself and your TRS-80 with the **Encyclopedia for the TRS-80** and **Encyclopedia Loader**.

BEST DEAL!

Shipping and handling \$1.50 per volume for single volumes of books and cassettes, \$10.00 per item for foreign air mail. All Encyclopedias shipped UPS with complete street address; all Loaders shipped 1st class mail.

Photocopy of coupon is acceptable for ordering.

ENCYCLOPEDIA FOR THE TRS-80 & ENCYCLOPEDIA LOADER™

To Order Complete Sets (and save an extra \$15.00)

<input type="checkbox"/> Encyclopedia for the TRS-80 , volumes 1-10, EN8080L softcover edition	\$109.50
<input type="checkbox"/> Encyclopedia Loader Volumes 1-10 EL8000 A \$149.50 value	\$119.97
Save \$15.00 shipping and handling charge. When you order a complete set of softcover Encyclopedias or Loaders, WE PAY THE SHIPPING!	

To Order Single Volumes

Please indicate quantities.

<input type="checkbox"/> Softcover edition @ \$10.95 per volume
Vol. 1 Vol. 3 Vol. 5 Vol. 7 Vol. 9
Vol. 2 Vol. 4 Vol. 6 Vol. 8 Vol. 10
<input type="checkbox"/> Encyclopedia Loader @ \$14.95 per cassette
Vol. 1 Vol. 3 Vol. 5 Vol. 7 Vol. 9
Vol. 2 Vol. 4 Vol. 6 Vol. 8 Vol. 10

Payment Enclosed

VISA

AMEX

MasterCard

Card # _____

InterBank # _____

Expires _____

Name _____

Signature _____

Address _____

City _____ State _____ Zip _____

Mail to: Wayne Green Inc., Books Sales, Peterborough, NH 03458

339B8E

NEW PRODUCTS

edited by S.F. Tomajczyk

Multi-Color Plotters

The Strobe 200 drum-type plotter features an easy-to-use control panel, an efficient paper-loading system, and a holder that accepts a wide variety of pens for graphics and lettering. It plots areas of up to 8 by 10 inches, with a step size of .002 inches along the X or Y axis.

The plotter costs \$845, including a TRS-80 parallel interface card. An RS-232C serial interface for CP/M microcomputers provides four foreign-language character sets and costs \$195.

★★★★★

Strobe's Model 260 graphics plotter is an automatic six-pen version of the Model 200. It lets you plot graphs and charts using up to six different colors with automatic pen changes. Software options let you preselect colors before using the plot and to generate high-resolution bar charts, pie charts, and line graphs (at 500 steps per inch along both the X and Y axes). Alphanumerics are also included for

labeling charts and creating pages of text.

The Strobe Model 260 costs \$995 and includes an RS-232 interface. The pens are held in a cartridge, and each color pen is individually replaceable. For more information on these two plotters, contact Strobe Inc., 897 Independence Ave., Building 5A, Mountain View, CA 94043, 415-969-5130.

Reader Service ✓ 551

Watch Out for Falling Planets!

You are space-wrecked on a civilized alien planet that is apparently deserted. You and your robot companion, Floyd, have up to 10 days to solve riddles, stop the planet from plummeting into the sun, and save the planet's plague-stricken population. Nothing too difficult for the seasoned gamer... or is it?

Planetfall, written by Steven Meretzky, is the third in a series of science fiction games from Infocom Inc. The game heightens realism by increasing the interaction between

the player and Floyd, and by allowing players to find food, eat, sleep, get sick, and even dream. Depending on your actions, different moves take different amounts of time, a serious consideration since you are competing against time to win. All game commands are in English, with a vocabulary of over 600 words to draw from.

Planetfall's packaging is different from most other games. Inside a folder-like package you find a Stellar Patrol 1D Card, a space diary, futuristic postcards, and other elements that complement the story. Planetfall costs \$49.95, is available for both the Models I and III, and can be purchased from either Infocom Inc. (55 Wheeler St., Cambridge, MA 02138, 617-492-1031) or any major computer store.

Reader Service ✓ 555

Wild Irish... Disks?

A new flexible disk, produced using a special binding method, that cleans disks as they spin is being made by Irish Magnetic Industries Inc. (270-78 Newton Road, Plainview, NY 11803, 516-293-5582). The 5 1/4- and 8-inch disks are produced from high-quality, mylar-based, magnetically coated materials with unique surface lubricants that minimize head and disk friction and ensure data integrity.

All disks are individually

jacketed and are packaged 10 to a box. The 5 1/4-inch, 48-tracks-per-inch disks have a suggested list price of from \$32.90 to \$49.80 for single- to double-sided format, and single to double densities. The 8-inch disk costs range between \$49.80 and \$69.80 for single and double densities.

Reader Service ✓ 558

Model 4 Upgrade

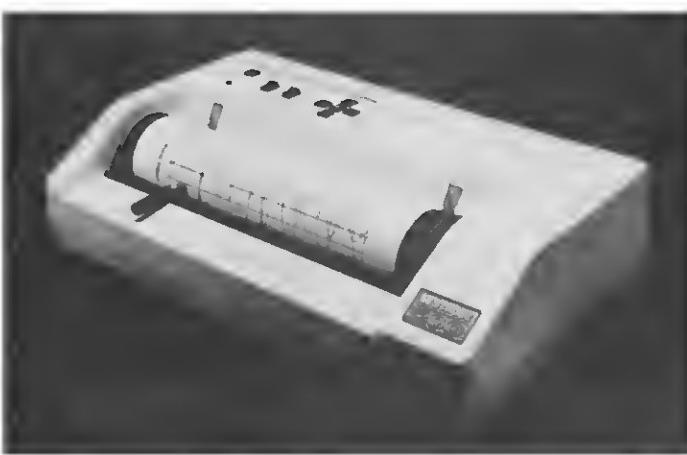
Now you can convert your 16K cassette Model 4 computer to a 64K or 128K disk-drive system with Micro-Design's new upgrade kit. This kit includes the new MDX-6 disk controller board, drive mounting towers, two disk drives, a power supply, sound board, an RS-232 serial board, and memory. An illustrated user's manual provides instructions on kit installation.

The MDX-6 disk controller board is redesigned to run with the Model 4 at its 4 MHz speed. It controls up to four installed or add-on disk drives. The drives may be either 5 1/4- or 8-inch capacity, single- or double-sided, or any combination. The MDX-6 also has gold-plated edge connectors to ensure trouble-free operation.

This upgrade kit costs \$399 and is available from Micro-Design, 6301 Manchaca Road, Suite B, Austin, TX 78745, 800-531-5002.

Reader Service ✓ 573

New Products listings are based on information supplied in manufacturers' press releases. 80 Micro has not tested or reviewed these products and cannot guarantee any claims.



The Strobe 200 multi-color plotter.

Ammicro introduces the first letter quality printer for \$680 that can also be used as a typewriter.



The MICROWRITER™ Daisy wheel printer.

There was a need for a low cost letter quality machine that would be suitable for use as an office typewriter, and as a computer printer. Ammicro met that need by combining the Microwriter parallel interface and the traditional Olivetti craftsmanship that was available in their Praxis machine.

With the Microwriter you can have the best of both worlds a letter quality printer, and a high quality office typewriter all in one machine, that sells for less than the cost of a good dot matrix printer!

It's not just printer or a typewriter that comes complete with a deluxe carrying case, but a feature-packed, lightweight machine that doubles as an office typewriter. This printer is a simple, low cost, reliable unit which can be utilized with word processing systems, microcomputers, personal computers, and small business systems. The Microwriter's low noise level and slim modern styling allow it to blend with any decor.

The Microwriter's print quality is identical to the finest office typewriters on the market. This machine is not only perfect for letters and manuscripts, but with its 165 character, 12 inch print width, the machine is perfect for letter quality budget spread sheets, price lists, data sheets, and forms.

The Microwriter can tab, rule single lines both vertical and horizontally, underline and print at 10, 12, or 15 characters per inch (switch selectable)! Its ten character memory for automatic error correction, lift off correction ribbon, and fixed or programmable page formats are a few of the many features that make it a perfect office typewriter. Microwriter not only handles letter and legal size sheet paper in widths up to 12 inches wide, but also handles fanfold paper.

There's a wide selection of 21 interchangeable daisy wheels available. And ribbon cassettes that just drop in.

Its operation as a computer printer is simple. Just load it up with paper and you are ready to go. Centronics compatible parallel output cables are currently available from stock for the following computers: IBM PERSONAL COMPUTER™, OSBORNE I™, ZENITH Z-100™, BURROUGHS B-20™, Convergent Technologies models IWS & AWSTM, TRS-80 MODEL I, II, III™, APPLE II™... custom cables also available by special order.

This machine creates a new standard by which all current low cost letter quality printers will follow. Ammicro's Microwriter is truly designed for the lifestyles of the 80's and for decades to come.

Why settle for just any printer when you can have a MICROWRITER.... a fine letter quality typewriter for you and your computer.

The Microwriter is the only daisy wheel printer on the market for \$680. For more information, see your local computer dealer or contact Ammicro directly.

ammicro corp.™

122 East 42 Street, Suite 1700, New York, N.Y. 10168
(212) 254-3030

✓ 258



MICROWRITER is a trademark of Ammicro Corporation. PARAXIS 30 is a trademark of Olivetti.

TURN BILLABLE TIME
INTO RECEIVABLE CASH
FAST-EFFECTIVE



DATA-TIMER TIME ANALYSIS and BILLING

**PROVIDE DATA SELECTION
BY JOB OR CLIENT**

PROVIDE PASSWORD PROTECTION

INSTANT ACCESS TO CLIENT FILES

PERSONALIZED DISK SYSTEM

**KEEP FAST,
ACCURATE RECORDS**

SAVE TIME

Data-Timer is the brand new computer program that manages your billable time and resources more accurately and more profitably. And it's so simple to use. Used in conjunction with your Day-Timer™ Diary, Data-Timer is the ideal package for:

business executives
consultants
accountants
attorneys
engineers
architects
advertising execs

physicians [either
individual or
group practice]
medical therapists or
anyone who bills on
an hourly basis

Each Data-Timer Package comes complete with a Program Diskette; easy-to-follow Program Document, DayTimer™ one full year desk scheduler, and User's Manual; a Quick Reference Guide; and a pad of 350 Data Entry forms. And Data-Timers works on your Radio Shack™ TRS-80 Models II, 12 and 16; IBM™ Personal Computer and System 23 Datamaster; and CP/M. Minimum requirements: 64K of memory, 225K of disk storage total. And every Data-Timer Package is backed by our 100% Guarantee of Satisfaction.



DAY-TIMERS, INC.
Subsidiary of BEATRICE FOODS CO.

ALLENTOWN, PA 18001

**DATA SYSTEMS COMPANY
HARRISBURG, PA. 17105**

Data-Timer is marketed nationally through Day-Timer Corporation, and Data-Systems Company. Regional Customizing Centers are available for unique personalized requirements.

*See Your Local Software Dealer for Software Contest Information.



To order: CALL 1-215-395-5884 or use coupon below



Please send me **Data-Timers**

@ \$295.00 for my **computer**

Company _____

Name _____

Address _____

State _____ Zip _____

Please send additional information. Dealer inquiries invited.

NEW PRODUCTS

Letter Quality for Under \$700

The ComRiter CR-II, a letter-quality printer, provides personal computer users with word processing features previously available only in more expensive printers. These features include superscript, subscript, backspace, underline, boldface, double-strike, and proportional spacing. It has a 5K buffer that lets you reproduce original and multiple copies of documents stored in memory. The buffer saves up to three pages of data and text.

The printer measures 19½ by 6 by 13 inches, weighs 20 pounds, and has an average print speed of 12 characters per second. The unit features bidirectional printing and logic-seeking. The print wheel comprises the standard 96 ASCII characters, and the ribbon is the standard cassette-type.

Optional features include tractor feed, color ribbons, a cut-sheet feeder, and interchangeable print wheels compatible with the Comrex CR-I

ComRiter daisy-wheel printer. The Centronics parallel version of ComRiter CR-II costs \$629; the RS-232C serial version \$699. It is manufactured by Comrex International Inc., 3701 Skypark Drive, Torrance, CA 90505, 213-373-0280.

Reader Service #576

Z80 Applications

With James W. Coffron's new book, *Z80 Applications*, you'll learn the necessary programming and interfacing techniques for connecting the Z80 microprocessor to common microcomputer expansion units. You will also learn how to use the Z80 with ROM, static and dynamic RAM, and how to use basic and advanced I/O techniques, such as interrupts.

This 288-page instructive text contains diagrams and thorough examples that explain everything you need to know to implement useful Z80 applications. It costs \$14.95 plus \$1.50 shipping when ordered from Sybex

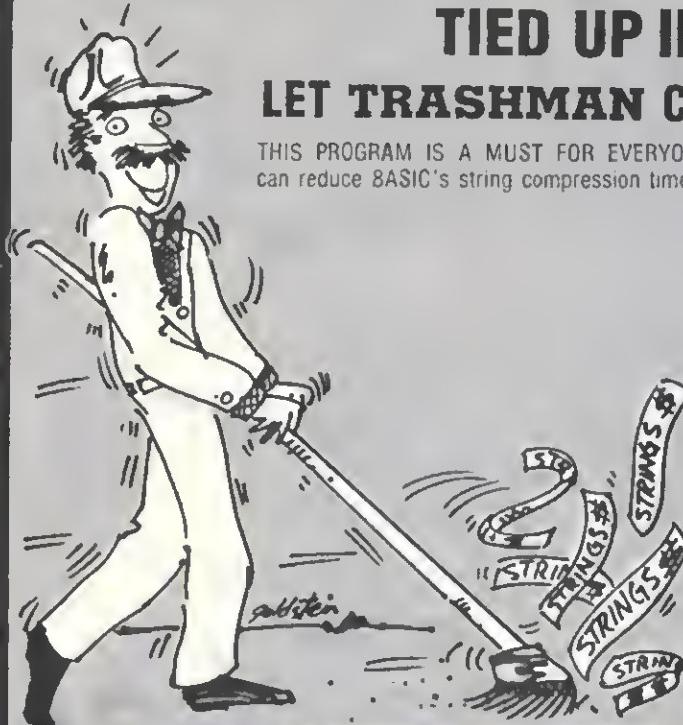


The ComRiter CR-II offers letter-quality printing and other word processing features.

DOES STRING COMPRESSION HAVE YOU TIED UP IN KNOTS?

LET TRASHMAN CLEAN UP THE MESS!

THIS PROGRAM IS A MUST FOR EVERYONE WHO USES "BASIC" ON A TRS-80. Why? Because it can reduce 8BASIC's string compression time delays by 95% or more.



# STRINGS	SECONDS DELAY NORMAL	SECONDS DELAY TRASHMAN	PERCENT IMPROVEMENT
250	11.8	0.7	94
500	45.8	1.6	96.5
1000	179.6	3.5	98
2000	713.2	7.8	98.9

(All timings done on TRS Model I. Model III 15% faster, but pct improvements identical. Listing of timing program available on request.)

SAVE TIME WITH FASTER



"FASTER" speeds up most TRS-80 BASIC programs by 20-50%. It's helped hundreds of satisfied people and it can help you. Detailed instructions make it easy to use. FASTER analyses your BASIC programs while they run, then displays a simple change, usually one line, that sequences program variables so the ROM will find them faster.

You can use FASTER to speed up programs you've bought, as well as programs of your own. Since it isn't a compiler, your BASIC programs can be read and changed afterwards. FASTER works on business programs, models, and games. The more complex your program, the better the results.

Does FASTER really work? Yes! Just check the reviews in Personal Computing, May, 1981, p. 116: "FASTER is effective and easy to use"; 80 U.S. Journal, April, 1982, p. 106: "I recommend FASTER to everyone"; and 80 MICRO (April, 1982, p. 40): "If you...would like a significant increase in the run-time speed, then buy FASTER."

FASTER runs on the TRS-80 Models I and III, 16-48K tape or disk, and all major operating systems. **\$29.95**

"QUICK COMPRESS" takes only 276 bytes of memory, and removes the blanks and remarks from even the largest BASIC program in less than 3 seconds. It produces smaller, faster programs without altering their logic. **\$19.95**

SPECIAL: FASTER and QUICK COMPRESS: **\$39.95**

TERMS: We accept VISA, MasterCard, checks, or even cash. Please add \$2.00 shipping handling within U.S.A. or Canada, and \$5.00 overseas. C.O.D. charge is \$2.00 in U.S. only. We ship within one day of receiving orders. In Calif., add 6 1/2% sales tax.

WHAT'S STRING COMPRESSION?

When a BASIC program changes a string (words, names, descriptions), it moves it to a new place in memory, and leaves a hole in the old place. Eventually, all available memory gets used up and BASIC has to push the strings together to free up some space. This takes time. Lots of time. The computer stops running for seconds or minutes, and you may even think it's "crashed".

Yes! String compression is what's been causing all those intolerable delays. The keyboard won't work, and until all the strings have been collected, you just have to sit and wait. Then things run for a while, until string compression is needed again. And again.

If you're using your computer for business, that wastes your money. If you're using it personally, it wastes your time.

WHAT'S THE SOLUTION?

As soon as you start using TRASHMAN, those delays will almost disappear. The program is very easy to use, so you don't have to be a computer programmer to take advantage of it. It's written in "machine language" and uses only 578 bytes of memory for itself, plus two bytes for each "string" in your program. It works with other machine language programs and all the major operating systems.

HOW WELL DOES IT WORK?

If you use it with a BASIC program that has only a few strings, very little time is wasted in string compression, and TRASHMAN will be only slightly helpful. But, in programs that use hundreds or thousands of strings, including large string arrays, TRASHMAN is just what you need. If you have any remaining doubts, just look at the chart, and then get yourself a copy as fast as possible.

TRASHMAN is available on disk for just \$39.95.

ATTENTION SOFTWARE PUBLISHERS:

Trashmen may be licensed for use with your packages. Call for details.

ERRATIC DISK DRIVES?

You can avoid unnecessary disk errors and repair hills by using **RPM**. This easy-to-use program measures the rotational speed and fluctuations of your disk drives, and warns you if they are running too fast, too slow, or unevenly.

Incorrect or erratic speed is a common cause of unexplained disk errors and loss of data. RPM's documentation explains how to detect and correct these problems quickly and easily. As 80 MICRO (April, 1982, page 41) said: "If your drives have problems I recommend RPM before paying to get it repaired."

RPM is supplied on diskette for the TRS-80 Models I and III. We suggest you order a copy before you need it.



\$24.95

ORDER FROM YOUR LOCAL SOFTWARE DEALER, OR CALL NOW, TOLL-FREE:

(800) 824-7888, Operator 422

**FOR ORDERS OR INFORMATION CALL:
(213) 764-3131, or write to us.**

PROSOFT®

Dept. G, Box 560, No. Hollywood, CA 91603 -95



COMPLETE MODEL III HARD DRIVE SYSTEM \$1295.

THIS IS NO JOKE. We have a large quantity contract to bring you the highest quality system at the lowest price available. The combination of Tandon Hard Drives and Western Digital's error checking and correcting drive controller board create the backbone of the Hard Drive Specialist System. The balance of the interfacing is by (the) oldest engineering teams in the Model III/ Hard Drive business. Unlike other hard drive companies, we rate a hard drive AFTER format (a 15 Meg drive is actually 19.1 MB before format). These units are fully assembled and tested ready to plug into your computer, all that you need to add is software. Power required 105-130 volts AC 60hz Dimensions 8-1/4" x 6-1/2" x 13" (just a little bigger than two regular disk drives)

Model III/ 4 HARD DRIVE SYSTEMS

5 MEG.....	\$1295.
10 MEG.....	\$1495.
15 MEG.....	\$1695.

Model I/ LNW/ MAX80 SYSTEMS

5 MEG.....	\$1345.
10 MEG.....	\$1545.
15 MEG.....	\$1745.

Model II, 12, 16 SYSTEMS

5 MEG.....	\$1595.
10 MEG.....	\$1795.
15 MEG.....	\$1995.

FREE SHIPPING

IN THE 48 STATES

NO CHARGE FOR CREDIT CARDS

DEALER INQUIRIES INVITED

HARD DRIVE SPECIALIST

a division of Compukit

Ordering Information

We accept Visa, Mastercard, Wire Transfers, and Certified Checks for quickest shipping. Orders received on personal checks are held for clearance.

1-713-480-6000 order line 1-800-231-6671
16206D Hickory Knoll, Houston, Texas 77565

MODEL 4 DRIVE KITS \$299

MODEL 4 STUFF MODEL 4 COMPUTERS

All include an RS232

No charge for shipping on any Compukit Computers	
64K one single headed drive.....	\$ 149.5.
64K two single headed drives.....	\$ 169.5.
64K two double headed drives.....	\$ 189.5.
128K systems add only.....	\$ 99.

MODEL 4 64K UPGRADE \$62.95

prime grade pre-tested RAM with instructions

MODEL 4 RS232 KIT \$69.95

completed and tested ready for installation

Model I, III, 4 green phosphor antiglare CRT Kit \$89.

a complete new CRT, not a filter

MODEL 4 DISK DRIVE UPGRADE KITS

All of the Compukit Model 4 Disk Drive Upgrade Kits contain these features that other companies usually do not provide. Switching power supplies * Tandon disk drives * 64K of Model 4 RAM * Sound * and an Easy to Use installation Manual. Requires only a screwdriver (no soldering) The no drive upgrade kit	\$299.
One drive upgrade kit.....	\$49.9.
Two drive upgrade kit.....	\$69.9.
Two double headed drive kit.....	\$99.

MODEL III to MODEL 4 UPGRADE \$750.

Converts your Model III into a Model 4 (except for Cabinet and disk drives). Includes new keyboard, 64K RAM, Sound, and free installation (required). Ship us any working Model III, even if it's not all factory equipment, and get back a Model 4, in your case.

MODEL 4 SOUND UPGRADE \$29.95

No soldering required, Includes instructions

COMPUKIT DOCTOR \$29.95

Disk based diagnostic software package for the Model I, III, and soon the Model 4

MODEL III DISK DRIVE UPGRADE KITS

All of the Compukit Model 3 Disk Drive Upgrade Kits contain these features that other companies usually do not provide. Switching power supplies * Tandon disk drives * 32K of Model III RAM * Compukit Doctor * and an Easy to Use installation Manual. Requires only a screwdriver (no soldering).	
The no drive upgrade.....	\$279.
One drive upgrade kit.....	\$479.
Two drive upgrade kit.....	\$679.
Two double headed drive kit.....	\$879.

MODEL III RS232 Kit \$69.95

completed and tested ready for installation

TANDON DISK DRIVES

Perfect for replacement or add on drives for any 5" drive system including Model I, III, 4, COCO, IBM PC, LNW, MAX80, and many more.	
Single Sided 40 track TM100-1	\$199.
Double Sided 40 track TM100-2	\$299.
Single case with extender.....	\$59.95.
Dual Case with extenders.....	\$89.95.
Two drive cable	\$24.95.
ask for a free copy of Doctor Robert's drive Manual with the purchase of any Compukit disk drive or Kit	

TANDON THINLINE DRIVES *all fast 6MS trk-to-trk*

TM50-1 SS-40trk \$159.

TM50-2 DS-40trk \$219.

new microprocessor drives

TM55-2 DS-40trk \$249.

TM55-4 DS-90trk \$299.

COLOR COMPUTER DRIVE O

Complete drive O including case and controller card
\$449.00

64K COCO KIT \$62.95

**NEW! COCO DRIVE O
\$399.**

*with a Tandon Thinline
SPECIAL INTRODUCTORY PRICE*

COMPUKIT

16206D Hickory Knoll Houston, Texas 77059

1-800-231-6671

1-713-480-6000

80 Micro, September 1983 • 343

Continuous Checks, Statements, and Invoices for Desk-Top Computers

- Compatible with software from over 300 sources. Or program to NEBS standard forms yourself.
- Continuous Micro-Perf™ Letterheads and matching continuous Envelopes provide a clean, trim look.
- Also, diskettes, continuous labels, other supplies and accessories.
- Our policy is to process forms printed with your name within 6 working days. Then ship direct to you (We pay shipping charges on prepaid orders).

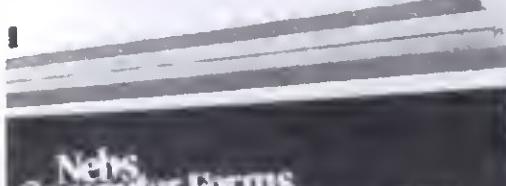
**QUALITY PRODUCTS
SMALL QUANTITIES AT LOW PRICES
MONEY-BACK GUARANTEE**

FREE Full-color, catalog

fast service by mail or phone

TOLL FREE 1 + 800-225-9550

(Mass. residents 1 + 800-922-8560)

NAME/TITLE	PHONE	
COMPANY		
STREET		
CITY, STATE, ZIP		
SOFTWARE BRAND	PACKAGE # <input type="checkbox"/> DO OWN PROGRAMMING	
COMPUTER BRAND	MODEL	PLAN TO PURCHASE WITHIN
YOUR LINE OF BUSINESS	NUMBER OF EMPLOYEES	
I MOST OFTEN USE MY COMPUTER FOR: <input type="checkbox"/> WORD PROCESSING <input type="checkbox"/> ACCOUNTING <input type="checkbox"/> OTHER _____		
 New England Business Services, Inc. A division of New England Business Services, Inc.		15108
		533

NEW PRODUCTS



Inland's Diskette Carousel.

Inc., 2344 Sixth St., Berkeley, CA 94710, 415-848-8233.
Reader Service ✓ 584

A Good Combination

Applied Creative Technology Inc. (2723 Ave. E East, Suite 717, Arlington, TX 76011, 800-433-5373 or 817-261-6905), makes an adapter, called Type & Print, that connects the Olivetti Praxis 30 and 35 to any Centronics parallel-interface computer.

This unit essentially provides you with a letter-quality printer for under \$500. The Type & Print costs \$179 and requires no soldering or hardware modifications for hook-up. The Olivetti Electronic Typewriter is readily available from most office supply stores at prices comparable to the lowest-priced dot-matrix printers.

Reader Service ✓ 566

Disk Carousel

Now you can protect and store up to 72 5 1/4-inch floppies in Diskette Carousel, a high-impact, smoked plastic rotating file. Disks are stored in colorful envelopes that brighten the room and help you color-code your disks. The rotary base stores disks

vertically so that the envelopes don't touch the magnetic coating. This minimizes static electricity and provides fast disk access.

The Diskette Carousel is compact. It measures 6 by 13 inches and can be stacked on other carousels. It is sold by Inland for \$29.95 (32051 Howard Ave., Madison Heights, MI 48071, 313-585-2330 or 800-521-8428).
Reader Service ✓ 564

Programmable Menu

A CP/M version of Custom Software Services' Programmable Menu is now available. Written in machine language, the Programmable Menu reads and displays menu selections created by the operator using any text editor.

Up to nine selections can be created for each menu, with multiple menus supported. Sub-menus return to the master menu by pressing the break key.

Designed to run under Pickles & Trout's implementation of CP/M 2.2 for Models II/12/16, the program costs \$29.95 and is sold by Custom Software Services, P.O. Box 150, Porterville, CA 93258, 209-784-7966.
Reader Service ✓ 572

NEW PRODUCTS

Back to School

VisiCalc neophytes can rest at ease. An audio cassette how-to book from FlipTrack Learning Systems "talks" you through the development of a complex VisiCalc model. *How to Use VisiCalc* begins with the basics like setting up a spreadsheet with labels, values, and formulas, and progresses to more advanced concepts, such as replicate, choose, lookup, and net present value functions. The result is an effortless introduction to every VisiCalc command and function.

The course is presented in a friendly, conversational manner on four cassettes, accompanied by a fully indexed lesson summary. By flipping over the tape at key points in each lesson, you can receive additional information on special-interest topics. *How to Use VisiCalc* costs \$65 and is available from FlipTrack Learning Systems, P.O. Box 711, Glen Ellyn, IL 60137, 312-790-1117.

Reader Service ✓ 569

* * * * *

The CP/M Workshop is a simple-to-use program that shows first-time users of CP/M-based microcomputers how to get started. The program is entirely self-paced and comes complete with diagrams, exercises, reviews, demonstrations, hints, and evaluation sessions. Within a very short time you can begin to run programs, control information on floppy disks, copy files, and print documents using rapid, interactive, and graphics formats.

CP/M Workshop comes complete with a user's manual, and both a working and backup disk for 8-inch drives. It costs \$115. For more information, contact Datascan Inc., 2716 Ocean Park Blvd., Santa Monica, CA 90405, 213-452-9114.

Reader Service ✓ 553



How to Use VisiCalc: Starts with the basics.

Save Your Data!

Inmac's Datasaver protects computer systems by taking over the computer's power requirements within 12 milliseconds of a detected brownout or total power failure. It supplies back-up power for two to five minutes at full rated power output, and for 15 to 30 minutes at half rated output load. A front panel LED and a buzzer alert you to the shortage, giving you time to shut down the system before ac power loss occurs.

Datasaver consists of a rechargeable battery with an automatic charger, a solid-state power inverter, an ac line-voltage monitor, and a cut-out switch. It is available for both the Models I and III and costs \$485 from Inmac (2465 Augustine Drive, Santa Clara, CA 95051, 408-727-1970).

Reader Service ✓ 550

Misosys' Version III

Version III of Misosys' labeling disassembler is now available. It disassembles Z80 object code files directly from disk or from memory. Output is directed to a paged display, a printer listing, or a source-disk file. The line-numbered output file is automatically partitioned into multiple files whose size the user defines.

Version III screens text

TRS-80 COMPUTERS

ALL FUTURE RADIO SHACK EQUIPMENT

DISCOUNT

15%
AND UP

OFF SUGGESTED LIST

COMPUTERS

ALL TRS-80 MODELS

CALL FOR COMPETITIVE PRICES



PRINTERS

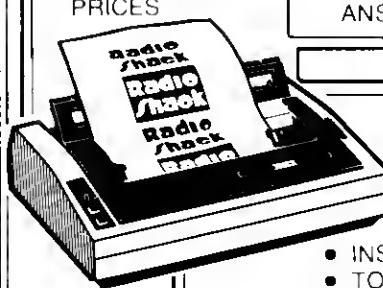
- RADIO SHACK
- EPSON
- OKIDATA
- C ITON
- SMITH CORONA

CALL FOR COMPETITIVE PRICES

ACCESSORIES

WE CARRY A FULL LINE OF

- SOFTWARE
- HARD DRIVES
- MODEMS
- PRINTER ACCESSORIES
- TELEPHONES AND ANSWERING MACHINES



GAMES

- BIG FIVE
- ADVENTURE
- SPECTRAL
- INSTANT SOFTWARE
- TOM MIX SOFTWARE

FREE PLEASE WRITE AND REQUEST

- CUSTOMER DISCOUNT PRICE LIST
- MANUFACTURE WARRANTIES

TRS-80 TANDY CORPORATION

PERRY COMPUTERS

DET. NO. 641 137 NORTH MAIN ST. PERRY MI 48062

FOR ORDERS CALL 1-800-248-3823

FOR INFO. HAMILTON CALL (517) 525-3151

WE'RE GIVING MAIL ORDER A GOOD NAME . . .

You no longer have to sacrifice quality products, personal service, or fast delivery for rock-bottom prices. With **MICRO DATA SUPPLIES**, you can have it all. And it's only a phone call away: (216) 481-1600. Looking forward to your call.

Russ Knotts

Russ Knotts • President



We sincerely thank our thousands of past customers who have made this claim possible.

NEWDOS/80 Version 2.0

Model I and Model III

The hottest Disk Operating System is now available in its latest version. This is the ONE from Apparat, Inc., the people whose systems have made the TRS-80 the reliable computer.

\$139.95



THE FLOPPY DOCTOR

By Dave Stambaugh

FLOPPY DISK/MEMORY DIAGNOSTIC programs are designed to thoroughly check out the two most trouble prone sections of the TRS-80, the disk system (controller and drives) and the memory arrays.

MODEL I \$24.95
MODEL III \$29.95

BOOKS

OTHER MYSTERIES

TRS-80 DISK	\$19.95
Microsoft Basic Decoded	\$24.95
The Custom TRS-80	\$28.95
Basic Faster & Better	\$29.95
How To Do It On The TRS-80	\$28.95
TRSDOS 2.3 Decoded	\$28.95
The Custom Apple	\$28.95
Machine Language Disk I/O	\$29.95
CP/M Primer	\$15.95

LABLMAKER

The most useful program you'll ever own Prints Marking Labels on standard 1" x 3 1/2" labels. Sixteen print formats to choose from including the Hi Visibility Jumbo Print Type TRS-80 Model I & III, 48K, 1 Drive, Epson MX-80 type printer (Or equivalent)

LABLMAKER KIT — w/400 5/16" x 3 1/2" labels	\$29.95
CASSLABEL Kit — w/200 cassette labels & 200 5/16" x 3 1/2" labels	\$34.95



**MICRO
DATA SUPPLIES**

DISKIT III™

MODEL III & IV DISK UPGRADE



Floppy Doctor with
the purchase of
any DISKIT III
\$30.00 VALUE!



- Features
- Gold Plated Edge Connectors
 - Switching Power Supply
 - Supports 5" or 8" Drives
 - 40 80 Track Supported
 - Single Dual Head Supported
 - Metal Disk Drive Brackets
 - All Hardware and Cables
 - 1 Hour or Less for Installation
 - 100% Compatible
 - No Soldering Needed
 - 180 Days Warranty on Controller

DISKIT III w/o Drives	\$229.00
DISKIT III w/one Tandon 100-1 40 Track Drive	\$439.00
DISKIT III w/two Tandon 100-1 40 Track Drive	\$639.00
DISKIT III w/two Tandon 100-2 40/40 Dual Drive	\$799.00

DEALER INQUIRES WELCOME

PRINTERS

New Lower Prices

GEMINI 10 by Star Micronics	\$349.00
GEMINI 15 by Star Micronics	\$499.00
Okidata Microline 82	\$429.00
Okidata Microline 83A	SCALL
Okidata Microline 84	SCALL

PRINTER ACCESSORIES

Graftrax Plus	\$85.95
MX-80 Ribbons	7.95
MX-100 Ribbons	18.95
Epson Service Manual	34.95

PRINTER CABLES

TRS-80 Model I & III 10 ft Parallel	\$24.95
10 ft Parallel cable extensions	24.95

MICRO DATA SUPPLIES

A SUBSIDIARY OF THE COMPUTER WAREHOUSE, INC. OF OHIO

22295 EUCLID AVE. EUCLID, OHIO 44117

ELECTRIC PENCIL

Version II

Model I and Model III

An expanded version of the critically acclaimed original word processing system! Includes all features of Version I plus many new extensions

Disk Version	\$79.95
Tape Version	\$69.95

ELECTRIC WEBSTER

"Cadillac" of Spelling Checkers 80 Micro 9/82.

- 50,000 WORD DICTIONARY
- FAST and ACCURATE - No other Spelling Checker comes close!
- INTEGRATED - Proofs and corrects from within most popular word processing programs!
- SMART - Finds and displays correct spelling!
- HYPHENATES automatically - inserts discretionary hyphens with 100% accuracy (optional).
- COMPLETE - One step proofing system.

Electric Webster w/correcting feature	\$129.95
Hyphenation feature	\$49.95
Grammatical feature	\$39.95
COMPLETE SYSTEM all Four Programs	\$199.00

NEWSRIPT 7.0

NEWSRIPT is the versatile TRS-80 word processing program. It supports "smart" printers like the Epson, Okidata, NEC, C Itoh, Spinwriter, Centronics 739 and more

NEWSRIPT	\$109.95
----------------	----------

THE HOME ACCOUNTANT

The #1 best selling program for home and small business accounting is now available for TRS-80 Model 3. Handles up to 99 accounts, five checkbooks, multiple income accounts, and can split transactions to any number of accounts. Prints net worth statements, income statements, as well as custom designed reports. Displays a bar chart and trend for any selected category. It is easy to use and yet provides all the power you'll need. (By Continental Software, requires Model 3, 2 drives, 48K) \$62.95



Verbatim

PREMIUM DISKETTES AT AFFORDABLE PRICES

VERBATIM DATALIFE™ DISKETTES

5 1/4-inch (box of 10)
MDS25-01
1S/0Den

~~\$25.95~~

Soft-Sector Diskettes

5 1/4" 2S/D Den (MD550-01)	..... \$39.95
5 1/4" 2S/4 Den (MD557-01)	..... \$51.50
8" 1S/D Den (FD34-8000)	..... \$43.95

Hard-Sector Diskettes

5 1/4" 1S/D Den 10-sector (MD525-10)	\$26.95
5 1/4" 2S/D Den 10-sector (MD550-10)	\$39.95
5 1/4" 2S/4 Den 10-sector (MD557-10)	\$51.50

SUPPLIES

5 1/4" File Box for 50 diskettes	..... \$24.95
AVERY TABULABLES	
5,000 3 1/2" x 15/16"	\$15.95
FAN FOLD PAPER (Prices F.O.B.S.P.)	
9 1/2" x 11 1/8 lb WHITE 3,000 ct	\$29.95
14 1/2" x 11 1/8 lb WHITE 3,000 ct	\$39.95
Head Cleaning Kit	\$17.95
★ ★ ★ THIS MONTH'S SPECIAL ★ ★ ★	
FLIP'n FILE w/10 Bulk Diskettes	\$39.95
Head Cleaning Kit w/10 Bulk Diskettes	\$34.95

DISK DRIVE CABLES

Disk Drive Cable for 1 Drive	..... \$18.95
Disk Drive Cable for 2 Drives	..... \$24.95
Disk Drive Cable for 4 Drives	..... \$29.95
All Cables Are 5 Ft. Long	

DISK DRIVES

Complete with Chassis & Power Supply

Fully assembled silver chassis with external card edge connector for easy cable installation. With MDS 120 days warranty



COMPLETE

TM100-1 40 Trk	..... \$249.00
TM100-2 40/40 Trk	..... \$329.00
TM100-4 80/80 Trk	..... \$399.00

MOD. III COMPLETE CASE & POWER SUPPLY
SIEMANS FDD100-8 SS/DD 8 in .. \$472.00

BARE DRIVES

TM100-1 40 Trk	..... \$189.00
TM100-2 40/40 Trk	..... \$259.00
TM100-4 80/80 Trk	..... \$329.00
SIEMANS FDD100-8 SS/DD 8 in	..... \$279.00
TM84B-1 SS/DD 8" 77 Trk Thinline	..... \$369.00
TM84B-2 DD/DD R" 77 Trk Thinline	..... \$479.00

SUPER WABASH SALE!

Bulk Diskettes* with envelopes

5 1/4" SOFT SECTORS	8" SOFT OR 32 SECTORS
SINGLE SIDE SINGLE DENSITY W/HUB RING 100% CERTIFIED 1 YEAR WARRANTY	SINGLE SIDE SINGLE DENSITY 100% CERTIFIED 1 YEAR WARRANTY
\$1.59*	\$1.69*
5 1/4" SOFT SECTORS	8" SOFT OR 32 SECTORS
SINGLE SIDE DOUBLE DENSITY W/HUB RING 100% CERTIFIED 1 YEAR WARRANTY	SINGLE SIDE DOUBLE DENSITY 100% CERTIFIED 1 YEAR WARRANTY
\$1.89*	\$2.29*
5 1/4" SOFT SECTORS	8" SOFT OR 32 SECTORS
DOUBLE SIDE DOUBLE DENSITY W/HUB RING 100% CERTIFIED 1 YEAR WARRANTY	DOUBLE SIDE DOUBLE DENSITY 100% CERTIFIED 1 YEAR WARRANTY
\$2.79*	\$3.09*

*Now Get High Quality at a Low Price
Manufactured by a Major Disc Company

For MDS Without Their Name on Diskettes

*Minimum order 20 diskettes with

Tyvek envelope and storage shipping box

*Quantity discounts - 100 deduct 3%

1000 deduct 5%. 10,000 deduct 10%

MODEMS

Hayes Micromodem II (APPLE)	\$299.00
Hayes Smart Modem (RS-232)	\$239.00
SIGNALMAN DIRECT CONNECT (RS232) 300 Baud	\$94.95
U.S. ROBOTICS Inc.	
Auto Dial 212A, 300/1200 Baud Modem	\$599.00
Auto Link 212A, 300/1200 Baud Modem	\$549.00
Micro Link 1200, 1200 Baud Modem	\$449.00
Auto Link 300, 300 Baud Modem	\$219.00

Practical Peripherals

MICROBUFFER

MBP-16K Parallel	..... \$149.00
MICRDBUF IN-LINE For Most Printers	
32K Parallel	..... \$289.00
64K Parallel	..... \$339.00
32K Serial	..... \$289.00
64K Serial	..... \$339.00
64K Memory Expansion Modules	.... \$169.00

SUPER COMPUTER

LNW

TRS-80 Mod. I Expansion
\$349.00

- RS232c serial I/O
- Full 32k 200ns RAM
- Parallel printer port
- Real time clock
- Gold plated connectors
- 6 month warranty
- Heavy steel case
- Floppy disk controller
- Thousands of users
- Works with any DOS 100%

SPRINTER

Double Your Speed

Speed-up cuts computer operation time in half, saves time and money. Fast 4 MHz Z808 CPU included, installs in 15 minutes with no soldering or cutting.

SPRINTER III for MDD III \$95.95
SPRINTER I for MDD I \$95.95

MODEL I DOUBLE DENSITY PACKAGE

Everything you need to convert your TRS-80 Model I to run double density. Complete with software, hardware, and instructions, installs in minutes with no soldering, wiring or cutting.

Dosplus V 3.4 w/LNDOUBLER 5/8 .. \$199.00
LNDOUBLER 5/8 Board w/o dos .. \$169.00

16 K RAM SPECIAL

4116. 200ns Guaranteed one full year \$17.95

ELECTRONIC PROTECTION DEVICES

The PLUM 3-way EMI-RFI AC Power Line	
Noise Filter (wall outlet)	\$44.95
The LEMON - 6-way Surge Suppressor for	
AC Power Lines (wall outlet)	\$54.95
The LIME - same as LEMON w/5ft.	
cord and on-off switch	\$79.95
The PEACH - 6-way Surge Suppressor,	
EMI-RFI Line Filter (wall outlet)	\$89.95
The ORANGE - same as LIME w/EMI-RFI	
Filtering PLUM & LIME Combined	\$129.95

ULTRA TERM

Supports both manual and auto dial modems. Exclusive Ultra Term direct to disk file transfer mode, allows unattended operation at the receiving computer. Line printer support with a 1K print buffer. Half & full duplex support. Universal ASCII format file transfer with a 33K buffer and a full featured host program .. \$49.95

Call (216) 481-1600
MONDAY thru SATURDAY
DEALER INQUIRIES WELCOME

WE ADDRESSES:
 • VISA
 • MASTERCARD
 • DISCOVER
 • MONEY ORDER
 • AIR MAIL

ALL PAYMENT
METHODS
ARE
ACCEPTED
BY CHECK,
CREDIT CARD
OR MONEY
ORDER.

OUR POLICY
IS TO
REFUNDS
AND EXCHANGES
AS
EASILY AS
POSSIBLE.
WE
DO
NOT
REFUND
SHIPPING
COSTS.

MAIL
DROPS
PRICES
ONLY

Free U.P.S.
on all prepaid
orders over
\$100.00 in
U.S.A.



Hand-held laser bar code scanner.

data to direct the disassembler to output selected address fields as byte, word, or literal data. These output formats are double-byte and double-word statements compatible with the EDAS assembler.

Two Version III packages are available: DSMBLR is supported under TRSDOS and LDOS on the Model I/III, and PRO-DUCE supports LDOS 6.0 and TRSDOS 6.0. Each costs \$40 and is sold by Misosys, P.O. Box 4848, Alexandria, VA 22303, 703-960-2998.

Reader Service ✓ 577

Wipe Away Your Problems

The Statkleer Cloth is impregnated with a dry chemical treatment that removes CRT static and built-up dust with a single wipe. Because it's made of flannel and uses no liquid cleaner, no streaking, film residue, or scratches affect your CRT screen.

It comes with a secure-seal pouch for storage, and, used daily, retains its chemical potency for up to six months. Each 12-by-12-inch cloth costs \$2.95 from Evans Specialty Co. Inc., 14 East 15th St., P.O. Box 24189, Richmond, VA 23224, 804-232-8946.

Reader Service ✓ 574

Model 100 Bar Code Readers

The Scanhandler MS190 is a lightweight (15-ounce) laser bar code scanner that is plug-compatible with the Model 100. With 5-volt wand emulator signal levels, the Scanhandler is a cost-effective alternative to wand readers and more expensive scanning systems.

All the optics and electronics required for non-contact scanning are contained in this Class I unit. The laser operates at 150 scans per second, has a near-100 percent first read rate, a 10-inch maximum depth of field, and delivers both audible and visual indications of successful reads.

This is the first laser bar code scanner to include scanning, decoding, and communications capabilities in a single unit. It costs \$1,800 (special OEM discounts available) and is available from Metrologic Instruments Inc., 143 Harding Ave., Bellmawr, NJ 08031, 609-933-0100.

Reader Service ✓ 559

★★★★★

Bi-Tech Enterprises Inc. (10B Carlough Road, Bohemia, NY 11716, 516-567-8155) now makes a bar code reader for the Model 100. It features a push-to-read switch that minimizes battery use, a



Bi-Tech's bar code reader for the Model 100.

scanning rate up to 76 cm/sec, solid-state reliability, digital output, and a low-friction tip. When held at an angle between zero and 30 degrees, it reads bar code lines as small as 0.3 mm.

The reader is completely self-contained, allowing you to read bar codes in a totally portable environment. Each unit comes with software to read bar code and sample interface routines. It costs \$279.95 and comes with a 90-day warranty on parts and labor.

Reader Service ✓ 585

Compact Disk Carrier

Diskaddy is an anti-static vinyl disk carrier that stores up to 22 disks (both 5 1/4- and 8-inch) in accordion-style pockets. Each pocket holds

two disks, comes with two indexes for filing, and has an inner pocket to store disk directories. Adjustable pocket flaps have visible index tabs for disk labels and an elastic closure to secure the unit.

Diskaddy is used to carry valuable disks from place to place, to file disks in an accessible unit where every disk is readily seen, and to store disks in a protective, compact unit.

It is available from Fourdee Products Co. Inc., 9380 Activity Road, Suite J, San Diego, CA 92126, 619-693-1105. Retail prices start at \$5.99.

Reader Service ✓ 567

Go Ape Over Bananas!

Banana is an 80-column dot-matrix printer from Lead-



Diskaddy: Now you can tote your disks around with you.

Subscription Problem?

80 Micro does not keep subscription records on the premises, therefore calling us only adds time and doesn't solve the problem.

Please send a description of the problem and your most recent address label to:

80micro
Subscription Dept.
PO Box 981
Farmingdale, NY 11737

Thank you and enjoy your subscription

80micro Single Back Issues



January 1980 to June 1980 3.00
Single back issue
July 1980 to May 1983 3.50
Single back issue
June 1983 on 4.50
Add \$1.00 per magazine for shipping.

10 or more back issues

add \$7.50 per order for shipping.

Back issues • Attn. Mail Order
80 Pine St. • Peterborough, NH 03458

PRESERVE 80 MICRO WITH BINDERS & FILE CASES.

Keep your issues of 80 Micro handy and protected in handsome and durable library file boxes or binders. Both styles are bound in dark green leatherette with the magazine logo stamped in gold.

File boxes: each file box holds 12 issues, with spines visible for easy reference.

\$5.95 each, 3 for \$17.00, 6 for \$30.00

Binders: each binder holds 12 issues and opens flat for easy reading.

\$7.50 each, 3 for \$21.75, 6 for \$42.00

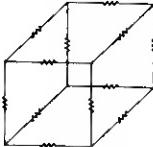
IUSA postage paid. Foreign orders must include \$2.50 per item.)

Please state years desired (1980 to 1984).

Send check or money order to:

Jesse Jones Box Corp., P.O. Box 5120, Philadelphia, PA 19141; please allow 6 to 8 weeks for delivery. Sorry, no C.O.D. or phone orders.

CIRCUIT SOLVER I



You don't have to be an engineer to make productive use of this program. A large clear manual leads you through the use of Circuit Solver using sample problems which have practical application.

Features

- Simple Circuit Entry
- Circuit Listing
- Circuit Storage & Retrieval
- Easy Circuit Editing
- Supports Op-Amps
- Many Useful Sample Circuits

ORDER

CSI-100C	PET CBM 64*	\$34.95
CSI-101C	APPLE*	34.95
CSI-102C	TRS-80*	34.95

Include \$2.50 shipping and handling.

* PET CBM 64, APPLE and TRS-80 are trademarks of Commodore, Apple Computer and Tandy Corp.

SHS SOLUTIONS

1430 N. LATROBE
SUITE 2A
CHICAGO, IL 60651

✓ 432



"CC" RISER



- Raises & tilts TV monitor for easy viewing
- Allows CC keyboard to slip under monitor for more desk space
- Matching silver-gray fiberglass
- \$37.50 + \$2.50 shipping

"80" DEMI-CASES

- Models for LNW or MDX I & II Boards
- \$32.50 + \$2.50 shipping

N.Y. Residents Add 7% Tax ✓ 174

SYRACUSE R & D CENTER

Box 125, Dewitt, N.Y. 13214
"Specializing in Electronic Packaging"

YOUR NAME HERE

PERSONALIZED COMPUTER PAPER

Printed with your name, club, anything. Paper is white 20# stock and fits all printers using 9½x11 continuous paper [8½x11 when detached]. **500 sheets \$14.95, 1000 sheets \$24.95. We pay shipping.**

Texas orders add 5½% tax. Select ink color: red, blue, brown, gray or canary. Specify name(s) up to 30 letters & spaces. Enclose check or money order. No C.O.O.'s. Allow 3 weeks. Faster delivery with M/C, Visa phone orders. Write or phone **Personalized Computer Paper E**, Box 20539/San Antonio, Tx, 78220/[512] 227-0585. ✓ 239



DISK BACKUP ONE MEGABYTE ON A C-50 MODELS I or III

Includes Disk to Disk Copy, Auto Mixed Density Recognition, Supports most Double Density Boards, Configuration Mode For Your System, Hassle Free Cassette Recorder Operation, Set Volume Control to Maximum and Forget It, Tape Disks at Computer Clock Speeds to 4 MHz, Auto Retrieval of Taped Disk with Formatting, Will Backup Most Popular Dos Made Disks, Includes Cassette Recorder Controller, Power Supply, Computer Ribbon Cable, Disk & Manual.

Minimum Requirements: Model I, or III Computer, One Drive, Recorder with Cable, 32K of Memory, Specify your TRS-80 Computer Model, \$149.95 Plus \$5.00 for Handling & Shipping.

PLEASE WRITE FOR MORE INFORMATION.

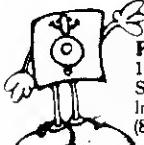
BETA ENTERPRISES INC.
14049 Settlement Acres Drive
Cleveland, Ohio 44142
(216) 362-6191 ✓ 25

Maxell Floppy Disks

The Mini-Disks
with maximum quality.



Dealer inquiries
invited. C.O.D's
accepted. Call
FREE (800) 235-4137.



PACIFIC EXCHANGES
100 Foothill Blvd., San Luis
San Luis Obispo, CA 93401.
In Cal. call (800) 592-5935 or
(805) 543-1037.

✓ 207

MICRO-DESIGN

High quality in the hardware business!

MICRO-DESIGN for full service TRS 80 hardware support. Micro Design offers the TRS 80 owner a complete line of control systems, printers, upgrades, disk drives & much more. Micro Design also offers an amazingly low priced complete Model 4 system that includes double disk drives and the complete MOX upgraded "muscle" system.

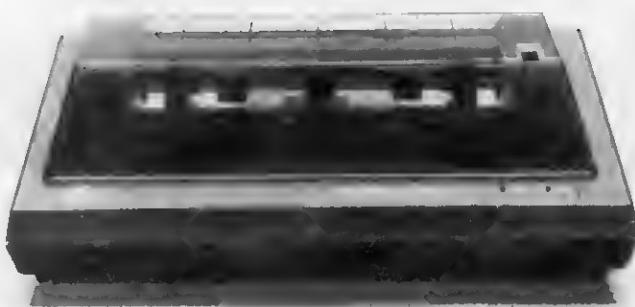
VISA & MASTERCARD Accepted ✓ 76

MICRO-DESIGN

FAX: 800-531-5002 • 800-531-5002

1-800-531-5002

1-800-531-5002



The Gorilla/Banana dot-matrix printer.

ing Edge's new Gorilla line. It prints alphanumerics or graphics characters on fan-fold forms from 4½ to 10 inches wide, and prints 50 characters per second. The characters are printed in a clear 5-by-7 matrix similar to that of CRT terminals.

Although the Banana has the standard character spacing of 10 characters per inch, you can select double-width characters under software command. The printer also features both a character- and dot-addressable graphics mode, with a density of 63 by 60 dots per inch. Line spacing in the graphics mode is reduced from six to nine lines per inch.

Banana is compact (16 by 5 by 8 inches) and weighs 12 pounds. It has a Centronics-type parallel interface that allows direct hookup to the Models 1, II, and III. The Gorilla Banana is available for \$249.95 from Leading Edge Products Inc., 225 Turnpike St., Canton, MA 02021, 800-343-6833.

Reader Service ✓ 560

A Sex Change

A self-contained, pocket-sized gender changer that reconfigures cable-ends whose genders conflict is now available from Inmac (2465 Augustine Drive, Santa Clara, CA 95051, 408-727-1970).

The Gender Changer is an inexpensive alternative to replacing or modifying EIA

232 cables. The unit consists of two EIA 232 25-pin connectors placed back to back. Both male-to-male and female-to-female connectors are available, with all 25 pins connected. Each changer costs \$30 and comes with a one-year guarantee.

Reader Service ✓ 580

A Clean Hit

Copysource Anti-Stat Clean Kit is a quick and easy system for eliminating static dust on CRT screens for up to two months per treatment. Each kit contains 50 pads impregnated with a non-streak, non-stat cleaning solution and a lint-free buffing cloth.

This compact kit is conveniently affixed to your computer with self-adhesive mounting tape. Single kits cost \$12.95; three kits run \$32.85; 10 kits (a case) cost \$89.50. To order, contact Chope-Stevens Paper Co., Dept. 111, 1800 18th St., Detroit, MI 48216, 313-237-0300.

Reader Service ✓ 579

Model 16 Spreadsheet

Horizon Spreadsheet is a new and versatile spreadsheet designed for the UNIX operating system. It does, however, operate on any UNIX-like system, including Xenix for the Model 16.

The program offers the largest electronic spreadsheet available, a grid 256 cells

square (VisiCalc offers 64 by 256 cells). Unlike other systems, the Horizon Spreadsheet employs virtual memory for full use of all cells in the system.

It can be integrated to Horizon Word Processing, has a multi-line Help menu, and features powerful built-in functions including date arithmetic, and science and financial calculations. In addition, it permits both consolidation and extraction of multiple and subordinate spreadsheets.

Priced at \$245, the Horizon Spreadsheet is available from Horizon Software Systems Inc., 185 Berry St., Suite 4821, San Francisco, CA 94107, 415-543-1199.

Reader Service ✓ 552

No More Printer Fights!

Microbuffer In-Line is a printer buffer expandable to 256K. It provides memory buffer for a variety of output devices including serial or parallel printers, modems, typesetting equipment, word processors, plotters, and remote data entry.

Its Copy feature lets you print up to 255 hard copies

without tying up the computer. A touch-sensitive button on the front panel lets you specify the number of copies required. You can pause and continue the copying process as if no interruption had occurred. New data is sent to the buffer at any time during the copy process.

The buffer accepts incoming data from the computer at high speed and transmits it to the output device at the appropriate speed. You can specify nine different data transfer rates, ranging from 75 to 19,200 baud.

The Microbuffer In-Line System requires no software modifications, is available with a serial or parallel interface, and sells for \$299 (32K) and \$349 (64K). Additional memory costs \$179 per 64K. It is manufactured by Practical Peripherals Inc. (31245 La Baya Drive, Westlake Village, CA 91362, 213-991-8200) and comes with a full two-year warranty.

Reader Service ✓ 568

Lost for Words?

With FirstDraft and DocuMentor you'll never again face a blank page. FirstDraft is a text-formatting spreadsheet that helps you organize and outline documents before you invoke word processing software. By continuously refining the outline and answering computer prompts, you think through the design of the document before you begin writing.

DocuMentor, a document data-base manager, is the first computer-assisted writing package on the market. Any document that requires a standard organization but unique text requirements is covered. Templates that contain the structure, standard text paragraphs, and writing instructions are provided so you can customize your text.

Both software packages



The answer to eliminating dust: Anti-Stat Clean Kit.

CONQUER YOUR MOUNTAIN OF BUSINESS PAPERWORK



Because it's there. And it'll be there until you have Easy Calc, Business Analysis and Master Plot... three essential additions to the modern professional's survival gear. Why spend endless hours forecasting, calculating and graph-plotting when Instant Software's business programs can do it for you? At a fraction of the time. And at a fraction of what you'd expect to pay.

MASTER PLOT

Get your point across graphically with this professional graph-plotting and printing package.

- Enter graph data from keyboard equations or from your BASIC programs.
- Plot up to 10 sets of data on the same graph.
- Create your own plotting symbols.
- Choose any number of horizontal and vertical lines.
- Select your own number of interpolated points between your data points.
- Print graphs any size from 1 x 1 to 7 x 24 inches.

Plus much more! Make your charts and graphs the easy way...with Master Plot.

Requires: TRS-80* Model I only
48K Disk Epson **MX-80
printer with Graphtrax
#0435RD \$149.95

BUSINESS ANALYSIS

Get forecasting capabilities previously available only on large computers. This flexible, professional time series analysis and forecasting package lets you:

- Forecast and analyze sales.
- Perform product and business planning.
- Analyze stock, trends and growth rates.
- Research business cycles.
- Forecast spending and energy consumption.

Plus much more! Analyze and forecast like a pro with Business Analysis.

Requires: TRS-80 Model I and III 32K
Tape #0140R \$75.00
Disk #0152RD \$99.95

EASY CALC

Turn your TRS-80 into an electronic spreadsheet!

- Write numeric data into simple rows and columns on your screen.
- Add, subtract, multiply, divide or exponentiate single values or rows and columns.
- Calculate percentages and summations of rows or columns.
- Enter and save entire series of calculations.
- Handles up to 600 figures.

Written for non-computerists. Easy to understand instructions. Easy to use.

Requires: TRS-80 Disk 48K
Model I: #0269RD \$49.95
Model III: #0369RD \$49.95

**Epson is a trademark of Epson America. *TRS-80 is a trademark of the Radio Shack Division of Tandy Corp.

YES! I want to conquer that mountain!

Send me: #0269RD @ \$49.95 #0369RD @ \$49.95

#0435RD @ \$149.95 #0152RD @ \$99.95 #0140R @ \$75.00

- Check/MO
 Amer. Ex.
 MC
 VISA

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

CARD# _____ EXP. DATE _____

INTERBANK# _____ SIGNATURE _____

Add \$2.50 postage and handling

Instant Software

339B8C

1-800-258-5473

Rte. 101 & Elm Street

Peterborough, NH 03458 ✓598

DOT WRITER 3.0

More than a word processor! Typeset your text using any of our type styles (over 60) or create your own. TRS80 I/III, Epson, C.Itoh or compatible printers. Use your DOS and your editor. All new instruction manuals. Easy to use - best results! Now only \$79.95. Additional type styles \$29.95 per disk. Utility pack \$39.95. Read the reviews, they tell the real story! Call or write for more info! This ad was typeset with Dot Writer!

RCM COMPUTERS



221 HIRSHFIELD DR.
WILLIAMSVILLE, NY 14221
716-634-3026



✓273

COPYCAT

Disk backup utility

Now you can have a solution to the problem of protected software backup.

COPYCAT® is the most powerful disk backup utility yet designed for the TRS-80 Computers. It will automatically make a fast, exact copy of your master disk regardless of protection schemes used including CRC errors, dual density tracks, mixed sector lengths and irregular I.D. pack.

COPYCAT® is intended for your personal use only in making backup copies for your valuable protected software.

COPYCAT® runs on a 48K, 2 disk drive TRS-80 models I, II or 4. Specify model number when ordering.

All orders are processed within 24 hrs.
Non-certified checks require (2) weeks for bank clearance

COPYCAT® \$34.95

Add \$2.00 for postage and handling.
California residents add 6% sales tax.

OMNISOFT RESEARCH

2170 W. Broadway, #501A
Anaheim, CA 92804
(714) 772-5000
Dealers inquiries welcome

NEW PRODUCTS

are available for CP/M, 8-bit computers. FirstDraft costs \$195 and includes a user's manual and a book on computer-assisted writing; DocuMentor costs \$295; purchased together they cost \$395. For further information, contact PromptDoc Inc., 833 West Colorado Ave., Colorado Springs, CO 80905, 303-471-9875.

Reader Service ✓554

Hard Disk

VR Data has added Hard Disk III to its line of Winchester disk drives. The Hard Disk III Subsystem is available as a formatted 5 megabyte fixed and/or removable disk. It comes fully assembled and includes case, power supply, cables, and mounting hardware.

Other configurations available for the disk drive subsystem are 10-, 15-, 20-, and 30-megabyte capacities. Adapters for the Model I and III start at \$150, and the prices for the Hard Disk III start at \$995. Both are available from VR Data, 777 Henderson Blvd., Folcroft, PA 19032, 800-345-8102.

Reader Service ✓561

Power Console

The Model 038 from PMC Industries Inc. (9353 Activity Road, San Diego, CA 92126, 619-695-3520) is a new power

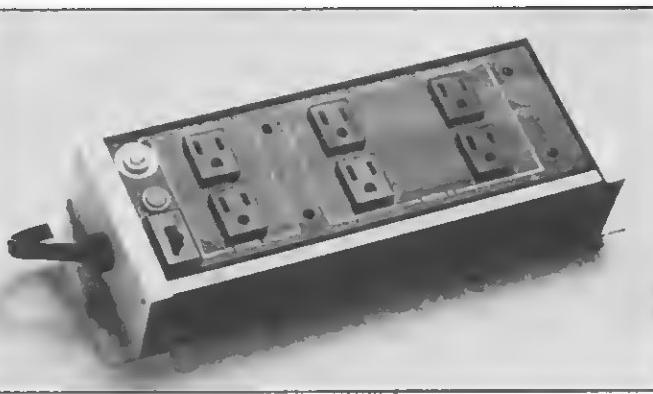
console specifically designed for use with personal and small business computers. It protects computers and data from power line noise, transients, and high-voltage surges. It eliminates RFI/EMI noise up to 55 decibels, and high-voltage and high-energy spikes up to 70 joules.

The unit comes with a 6-foot, three-wire shielded ac line, a 15-amp resettable circuit breaker, a main on/off switch, and a power indicator light. It can be wall, floor, or bench mounted, and comes in an aluminum and steel case that measures 13 by 4½ by 2 5/8 inches and weighs four pounds. All parts are UL listed. The unit is designed for 120-volt, 15-amp use, and costs \$125.

Reader Service ✓565

The Extender

You can now simplify Basic programming on the Models I and III with Solecronics' new software package. The Extender is a machine-language patch into the Basic interpreter that lets you use labels instead of line numbers to identify a line of the program in GOTO, GO-SUB, ON...GOTO, ON...GOSUB, ON ERROR GO-TO, or IF...THEN, and lets you use the first 40 characters of a variable name instead of only the first two characters.



Power Console for processors and peripherals.

This applies to simple variable names, array names, and function names of all types.

All currently running Basic programs and all Basic commands may be used with The Extender without modification. The program loads into the top 1000 bytes of memory and costs \$29.95 for both the Model I and III versions. To order, contact Solectronics, 400 Ashbury Ave., Evanston, IL 60202, 312-866-8737.

Reader Service ▶ 575

Let's Get Digital

Datalock is a high-quality digital tape assembled in a premium cassette shell with an oversized pad to ensure accurate alignment. Its specifications are superior to audio tape for digital recording: less distortion, cleaner high-end response, higher output ratio, and longer wear.

Datalock costs \$3.75 for a single cassette, \$5.95 for a two-pack, and \$29.95 for a 12-pack in a smoke-plastic case. For further information, contact National Distribution Center, 117 West 23rd St., Independence, MO 64055, 816-254-0400.

Reader Service ▶ 583

Helpful Wallcharts

Ever forget a VisiCalc or SuperScipsit command and were too lazy or busy to look it up? Crest Software (2132 Crestview Drive, Durango, CO 81301, 303-247-9518) has

found the answer: wallcharts of the systems' commands. Each 18-by-25-inch two-color chart graphically depicts all commands in large, readable type.

In addition to the commands, the chart depicts the keystroke combinations and provides explanations. In smaller print are the remaining operations and math functions. The result is a one-stop, all-inclusive reference center for anyone's use.

Both the VisiCalc and SuperScipsit charts cost \$4 each plus \$2 for handling and shipping. The SuperScipsit chart is designed for the Model III; the VisiCalc chart is for universal computer application.

Reader Service ▶ 582

Model I/III Goes Color!

Computer Shack has done the impossible! You can finally copy and use your Color Computer disks on any Model I or III. CIII (pronounced C-three) lets you copy programs and data files from machine to machine without conversions or retying.

It acts much like a variable file utility: insert CIII and the Color Disk of your choice into the disk drives and select the files you want to transfer. You'll be able to copy from a Model I/III to or from your Color Computer disk in a

MISOSYS ANNOUNCES!



- Disassemble from disk / memory
- Disassemble to disk / printer / video
- Automatic output partitioning
- Full label generation
- Data area screening - generates DB, DW
- \$40 + \$2 S&H

MISOSYS
P.O. BOX 4848
ALEXANDRIA, VA. 22303
703-960-2998



Datalock digital cassettes.

NEW PRODUCTS

matter of seconds.

CHI is available from major computer stores or directly from Computer Shack (1691 Eason, Pontiac, MI 48054, 313-673-8700) for \$24.95.

Reader Service ✓ 581

Disk Back-up

Beta-DTS lets Models I and III users back up one megabyte of disk images on a standard 60-minute cassette tape. Retrieval of a disk from cassette is automatic and includes formatting.

Beta-DTS requires a cassette recorder with cable, one disk drive, and 32K of memory. It comes complete with a self-boot operating system disk, a user's manual, and necessary hardware to do the job.

Available from Beta Enterprises Inc. (14049 Settlement Acres Drive, Cleveland, OH 44142, 216-362-6191), Beta-DTS costs \$149.95 plus \$5 for handling and shipping.

Reader Service ✓ 570

Printer Utility

The Printer Utility Package from MicroSmith Computer Technology (P.O. Box 1473, Elkhart, IN 46515) consists of eight programs to enhance your Model I's and

III's printing capabilities with the Epson MX-80. There are programs that allow direct printer initialization for bold, compress, and italic modes; print block, enlarged, normal, and small characters on lines left/right justified or centered; generate banners printed at 90 degrees to the normal lettering and run down the length of the paper; and print multiple copies of the same label on single- and double-wide label stock.

All these programs are supplied as Basic source files, and are written with special attention to the Epson MX-80 command codes. The package is available for either a 48K CP/M 2.0 system on a standard 8-inch single-sided, single-density disk or for the Models I and III with 48K. The price for either is \$35.

Reader Service ✓ 562

Bar Code Fever

The Bar Code Reader (Model BCR 232) from Digitronics is a compact handheld unit that reads, verifies, and transmits bar codes into a computer via the RS-232 port.

The unit has a ruby wand for scanning a bar code, and a microprocessor-based unit for translating the bar code

into digital data, verifying the code's readability, and then transmitting the data to a computer.

It costs \$595 and is manufactured by Digitronics, a division of Comtec Information Systems Inc. (53 John St., Cumberland, RI 02864, 401-724-8500).

Reader Service ✓ 557

Network Analysis

AC Network Analysis Program (ACNAP) analyzes electronic circuits with up to 70 components. It is optimized for speed and is capable of analyzing a five-node, 10-component circuit in less than one second. ACNAP works with component tolerances to provide worst case, Monte Carlo, and Sensitivity analysis.

Both linear and logarithmic frequency increments can be specified for all operations. Automatic noise equivalent bandwidth calculations are provided, as is the generation of a Spectral Data file.

ACNAP is menu-driven and allows simple entry and editing of circuits by component name. Models I and III versions cost \$39.95 and are available from BV Engineering, P.O. Box 3351, Riverside, CA 92519, 714-781-0252.

Reader Service ✓ 556

Blown Away

70 PSI is an aerosol dust and lint remover that removes microscopic dust from instruments, magnetic tape heads, and computer disks and drives. As the name implies, it delivers 70 pounds of pressurized, non-toxic inert gas triple-filtered for maximum purity. The gas leaves no residue and is moisture-free.

Each 14-ounce container has a three-way adjustable valve for precise spray control and an extension tube for

difficult-to-reach areas.

The product is available from Chemtronics Inc. (681 Old Willets Path, Hauppauge, NY 11788, 800-645-5244 or 516-582-3322) and costs \$3.75.

Reader Service ✓ 571

Printer Switch

The new Centronics-compatible Printer Switch from Intra Computer routes hard copy to a letter-quality daisy-wheel or high-speed dot-matrix printer. It measures 3 1/4 by 6 by 6 1/4 inches, and is both code and speed transparent.

The Printer Sharing Switch, also Centronics-compatible, lets two computers share one printer. The interface cable from a single parallel port of each computer is plugged into a connector on the Printer Sharing Switch. A built-in 6-foot cable is attached to the printer.

Both products cost \$165, come with a one-year warranty, and are available from Intra Computer, 101 West 31 St., New York, NY 10001, 212-947-5533.

Reader Service ✓ 563

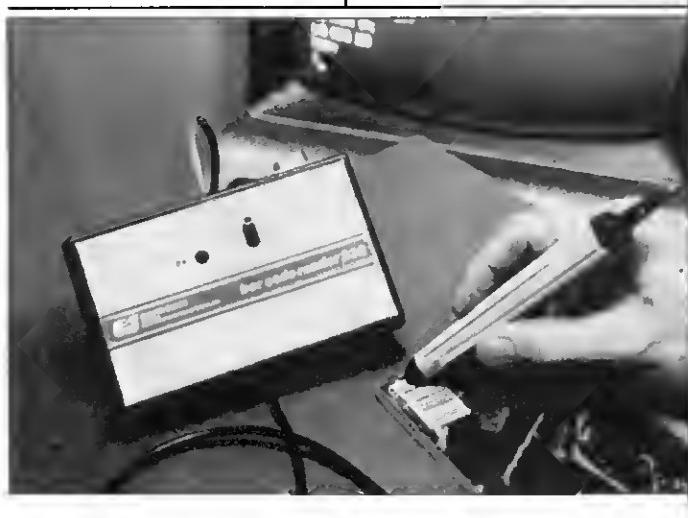
Model 100 Software

Typing Teacher, originally compatible with the Models I and III, is now available from Instant Software Inc. (Route 101 and Elm St., Peterborough, NH 03458, 603-924-9471) for the Model 100.

The program comprises a seven-part package that familiarizes you with key location, goes through words and phrases, and ends with complete mastery of the board. Screen diagrams show correct finger placement and related proper techniques.

Completely documented and fully guaranteed, Typing Teacher costs \$17.95 and requires 8K of memory.

Reader Service ✓ 578



Bar Code Reader for the RS-232 Port

If you guessed that a Practical Peripherals Microbuffer™ printer buffer saves time, you're right. For the way it works, this inexpensive product is the most practical addition to your microcomputer system ever.

With Microbuffer, you don't have to wait for your printer to finish before you resume using your computer. Data is received and stored at fast speeds, then released from Microbuffer's memory to your printer. This is called buffering. The more you print, the more productive it makes your workflow.

Depending on the version of Microbuffer, these buffering capacities range from a useful 8K of random access memory — big enough for 8,000 characters of storage — up to a very large 256K — enough for 256,000 characters of storage.

Practical Peripherals makes stand-alone Microbuffers for any computer and printer combi-

nation, including add-on units especially for Apple II computer and/or Epson printers. Each has different features like graphics dumps and text formatting besides its buffering capabilities. You can choose one that's just right for your system.

Best of all, they're built to last and work exactly like they're supposed to.

If you're still guessing whether you can afford to have one, talk with any computer dealer. That's the best way to find out how practical a Practical Peripherals Microbuffer is.



31245 La Baya Drive
Westlake Village, CA 91362
(213) 991-8200

v 11

GUESS WHO HAS MICROBUFFER.™



That's what you get with the LNW80 Model 2—undoubtedly the most versatile, powerful and fully equipped microcomputer in its class today. A machine so superior in concept and design, it will define the standards of microcomputer performance for years to come.

VERSATILITY

The LNW80 2 performs wonders with the most comprehensive array of software available to any microcomputer on the market today. Every LNW80 2 comes complete with the outstanding LNW 11 Business Software, **LNW SMALL BUSINESS AND PROFESSIONAL ACCOUNTING SERIES™**: General Ledger, Accounts Receivable, Accounts Payable, Payroll, **ELECTRIC SPREADSHEET™**, **ELECTRIC PENCIL™**, **WORD PROCESSOR**, **MICROTERM™**, **MODEM PROGRAM**, **CHART EX™**, **HIGH RESOLUTION BUSINESS GRAPHICS CHARTING PROGRAM**, **CRM 2.2™**, **DOSPLUS™**; **LNWBASIC™**, **MICROSOFT BASIC™**. In addition to a comprehensive line of LNW80 2 Software, it is also fully compatible with software from TPS-100 (Models 1, 3, 4), Cromemco® Wordstar®—a capability which gives you access to the most extensive and important sources of business, scientific, engineering and entertainment software applications. So no matter how big your disk and tape applications, the LNW80 2 will expand right along with you.

POWER

The LNW80 2 performs miracles with the computing power of 64K RAM standard, offering memory matched with a mass storage system featuring both 5½" floppy disks and 5½" Winchester drives. And while the unit comes with built-in

controllers for 5½" and 8" floppy disks (single/double sided, single/double density, up to 4.5 Megabytes capacity), the LNW80 2 also gives you the unique ability to read and write diskettes from a greater variety of other popular computers than does any other microcomputer. So regardless of how big you grow, you will never end up with thumb-twiddling down time while you expand to a more powerful system. The LNW80 2 will always have enough muscle to handle your biggest and toughest jobs.

FULLY EQUIPPED

The LNW80 2 was developed to anticipate the needs of both expansion and compatibility. So the computer was designed with enough built-in features to keep you from having to spend a small fortune as you move down the road to higher levels of user sophistication. Standard features include high and low resolution graphics in both color and black-and-white, an asynchronous serial communication channel, and a wide variety of tape, printer, monitor, and hardware expansion ports. In addition, the LNW80 2 contains an array of quality construction features that fully justify its remarkable one-year limited warranty.

So if you're looking for a microcomputer that will satisfy your performance needs as you grow and develop, take a long hard look at the LNW80 2. It's the microcomputer built to meet the challenges of tomorrow—for a long time to come. For more information and the name of the dealer nearest you, write or telephone:

LNW Computers

2520 Walnut, Tustin, California 92680

Telephone: 714/544-5744



**STATE-OF-THE-ART ENGINEERING
STATE OF TOMORROW PERFORMANCE.
LNW COMPUTERS**